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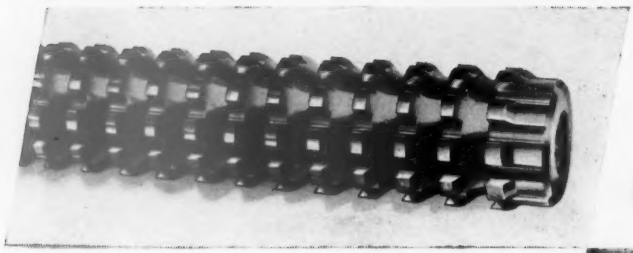

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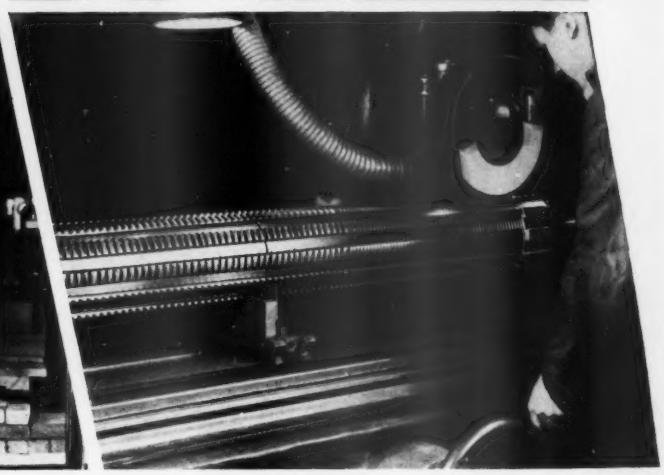

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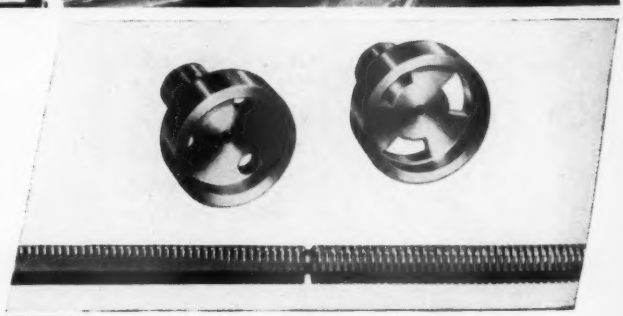

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Threat of Unemployment on the Railways

THE reality is now clear of the warning given last October by Mr. Peter Thorneycroft, then Chancellor of the Exchequer, that if wages were increased in certain industries, including the railways, services would have to be reduced, which might result in unemployment. Representatives of the three railway trade unions, the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen, and the Transport Salaried Staffs' Association, last week put their case for wage increases to the Railway Staff National Council, on which the British Transport Commission is represented by Members and senior officers. The unions were told that British Railways could not afford to pay increased wages, and that a further rise in labour costs now could be met only by measures such as reducing services, which could put railwaymen out of work. Rises in rates and fares, it was stated, would lose the railways traffic which they would not recover. The Commission was struggling to keep certain unremunerative services running; it was hoped that modernisation might make those services profitable, but they could not be made to pay if labour costs now rose again. Despite the poor freight receipts during the past months, there seems to have been little realisation among the rank-and-file of railwaymen of the serious economic situation of British Railways. The Government has stated that it will not increase its loans to the Commission to meet higher wages. A good many railwaymen may have gone as far as envisaging the possibility of a reduction in overtime payments, but the prospect of unemployment must be a shock—with, it is to be hoped, sobering effects. To many outside the railways it may come as an unpleasant surprise that unremunerative services form so great a part of the whole, and that the freedom in charging accorded to the railways by the freight charges scheme, in operation since last summer, has not produced higher receipts. Evidently there is much consumer resistance on the part of railway users, more particularly in the case of freight traffic. In the circumstances the arguments put forward by the unions as to the increased cost of living lose much of their force. It is to be hoped that the unions, which have decided to refer the matter of wage increases to the Railway Staff National Tribunal, will not continue to make demands that are unrealistic. The decision of the A.S.L.E.F. to refer the matter of shorter hours also to arbitration presumably is the result of that union's concern with the redundancy caused by single manning of diesel and electric locomotives.

Mr. R. W. Sewill

THE acute competition between the railways and road hauliers before the last war is recalled by the death, on January 26, of Mr. R. W. Sewill, recorded in our personal columns. As a farm pupil in his early years he learned the need for quick transport of milk and agricultural produce. When, in 1922, he became Managing Director of the London & Southern Counties Transport Co. Ltd., he was active in introducing road services for conveying farm produce to markets. These soon spread throughout the South and West of England; perhaps the most spectacular development was the "Flower Express" from Penzance to London, carrying Spring flowers from the Scilly Isles to Covent Garden market, which involved his firm in some controversy with the Great Western Railway in the Spring of 1932. At one time his company, which was a pioneer in fitting road vehicles with apparatus for hanging carcases from the roof, conveyed meat from Aberdeen and elsewhere in Scotland to Smithfield Market in London. The change in the relations between the railways and road haulage undertakings is shown by Sewill's appointment in 1939 as the first Chairman of the Road Side of the Road & Rail Central Conference. Among the positions he occupied in his own industry was the chairmanship in 1933-34-35 of the Road Haulage Association, of which he was a founder member.

P.W.I. Conversazione

ONE of the best of many pleasant features of the sixth annual conversazione of the Permanent Way Institution, held last Saturday in the British Transport Commission headquarters building in Marylebone Road, N.W.1, was the speech by Mr. R. F. Hanks, the guest of honour. His keen interest in railways, which dates from his training at the Swindon Works in G.W.R. days before he joined what developed into the Nuffield Organisation, is well known; and so is his experience of industrial administration. What was apparent in his address to the P.W.I. was his very considerable knowledge of the basic technical problems of permanent way men and his sympathetic understanding of their points of view. A brief account of the function is given on another page. Mr. John Ratter, Technical Adviser to the British Transport Commission and President of the Institution, welcomed the guests. The P.W.I. 1958 Summer Convention is being held at Weston-super-Mare; Mr. Hanks assured

his audience that the Western Region of British Railways would welcome them and do everything possible to make the convention a success.

New Argentina-Bolivia Rail Link

THE completion of the 282-mile railway between Yacuiba in Argentina and Santa Cruz de la Sierra in Bolivia, recorded elsewhere in this issue, provides a long-awaited connection with the rich eastern provinces of Bolivia; these produce, among other things, coffee, cocoa, rice, sugar, and wood, and possess great mineral wealth and petroleum deposits. A 300-mile branch between Boyuibe and Sucre is still under construction. The line, built under the auspices of a mixed Argentine-Bolivian committee, and financed mainly by Argentina, was begun in 1944, and the first 65 miles to Villa Montes completed in 1949. The gauge is understood to be one metre. The remaining 217 miles to Santa Cruz de la Sierra crosses the Rivers Parapeti and Guapay. The Parapeti bridge is 2,300 ft. long. The Guapay bridge has not yet been built; when completed in some two years' time it will allow direct traffic over the whole length of the line and eliminate the transhipment at present necessary. The cost of the line is estimated at some U.S.A. $35,000,000 of which $25,000,000 has been spent.

Overseas Railway Traffics

SALVADOR Railway Company receipts for October, 1957, were colones 153,000 compared with colones 184,000 for October, 1956. Aggregate receipts for the period July 1 to October 31, 1957, were colones 605,000 compared with colones 704,000 for the corresponding period of 1956; a decrease of colones 99,000. The Peruvian Transport Corporation Limited has announced from Toronto that the traffic receipts of its principal subsidiary, the Peruvian Corporation Limited, for the six months ended December 31, 1957, amounted to $5,993,385. The comparable figure for 1956 was $6,202,269. Receipts were adversely affected during the first four months of this period by strikes on the principal railways, and by a landslide which disrupted traffic on the Southern Railway. Costa Rica Railway receipts for December, 1957, were colones 1,758,691 compared with colones 1,438,185 for December, 1956, an increase of colones 320,506. Aggregate receipts from July 1 amounted to colones 10,394,774 (colones 9,305,069). At December 31, the official exchange rate was colones 15·87 to the £. Figures received from the Midland Railway Company of Western Australia Limited show that estimated road and railway receipts for November, 1957, were £A67,384 (against £A74,830 for November, 1956). Aggregate receipts for the five months July-November were £A357,370 (£A422,287 in 1956).

Argentina Seeks Material Further Afield

INDUCEMENTS in the form of long-term credits and other concessions made possible by State participation in or control of industry seem to be the reason for Argentina seeking railway material in countries other than its traditional suppliers. France and the U.S.S.R. and other Iron Curtain countries are being visited by an Argentine mission which seeks to buy railway and other material and is reported to be about to place orders for rails and steel tyres in Russia. Next month another mission, headed by Dr. Dante Ardigo, the President of the Argentine State Railways, is to visit Japan at the invitation of the Japanese Government to study railway practice there and to visit manufacturers of rolling stock and other equipment. In France no doubt the prospects will be discussed of electrifying sections of the Argentine railways at industrial frequency, and it may be that the French Government is considering technical assistance to Argentina of the type already being given to India. These visits show how far Government support is helping industry in several countries. Meanwhile the Argentine railway mission in London is reported to be making some progress in negotiating contracts with British manufacturers for spare parts for steam locomotives.

More Diesel Locomotives from Swindon

THE announcement that a decision has been taken by the British Transport Commission that 30 main-line B-B Type "4" 2,000 h.p. diesel-hydraulic locomotives are to be built at Swindon Works is referred to in this week's Contracts and Tenders section. These locomotives will incorporate Maybach engines and Mekydro hydraulic transmissions. They are additional to the three locomotives of the same design at present under construction at Swindon; the first of these is nearing completion and should be seen in the Western Region in the near future. This design is closely akin to the V.200 locomotives developed by Krauss-Maffei in co-operation with the German Federal Railway in 1953 embodying stress-skin construction; they differ in detail where requirements of loading gauge, wheel diameter, brake gear, height of buffing and drawgear and so on, vary from their German counterparts. The order represents a further step in the plans for diesel haulage of all Western Region trains west of Newton Abbot. Many through services between Paddington, Bristol and the West of England will also be diesel worked. Of the 130 diesel-hydraulic locomotives needed for this purpose—replacing over 200 steam engines—only 34, also of 2,000 h.p., now remain to be ordered. It is likely that the order for these will shortly be announced.

New York Central Passenger Service Reductions

THE recent request by the New York Central System to the Ohio, Indiana, and Illinois Regulatory Commissions to discontinue passenger service on the Indianapolis - St. Louis and Cincinnati - Toledo main lines emphasises the gravity of the passenger service operating deficit on the American railways. In the application it is claimed that the loss on the trains involved amounted to over $400,000 in 1956 and in 1957 it is estimated to involve approximately three times that amount. Passenger services on the New York Central are expected in 1958 to incur a deficit of about $50 million. Drastic measures had to be taken. Many trains have had to be combined, which has improved average loading per train, as was noted on a recent occasion when hardly a coach seat was available on the "Knickerbocker" on its departure from New York; in that train seats cannot be reserved. In the territories affected there are alternative passenger services by other railways and by bus lines which operate 27 journeys a day in the Indianapolis - St. Louis area. A recent agreement between the New York Central and the Pennsylvania provides for interavailability of tickets between the two routes—a new departure in the practice of these railways.

Advantages of Scale in Road Haulage

SOME of the advantages of large-scale road haulage operations were discussed by Mr. G. W. Quick Smith, Member, Board of Management, British Road Services, in his recent paper to the Scottish Section of the Institute of Transport in Edinburgh. As British Road Services, with their 16,000 vehicles, is the largest road haulage undertaking in the world, its experiences are of interest to operators elsewhere, including the U.S.A., where there is a trend towards amalgamation into large-scale road haulage fleets. Mr. Quick Smith concludes that a large organisation enables operations to be planned on the most economic basis and reduces empty running. Central control ensures a high load factor. Good communications, such as the B.R.S. teleprinter network, allow the utmost advantage to be derived from "tramp" journeys. Large-scale development in other industries requires that road haulage should be organised on a similar scale if a comprehensive service, such as that provided by B.R.S., is to be given. Personal service, he considers, can be given as readily by a large organisation as by a small one, provided there is suitable decentralisation. There is the further advantage, as far as B.R.S. is concerned, of close liaison with British Railways. The new B.R.S. depot at Low Fell, Newcastle, is, in fact, provided with rail access.

Radar for Railways

THE interest taken by Parliament in the subject of safety measures on British Railways led to a question in the House of Commons last week by Sir Alfred Bossom, who asked to what extent radar was being considered, to avoid future train accidents. The Minister of Transport & Civil Aviation, Mr. Harold Watkinson, replied that after consultation with radar specialists, the general conclusion reached was that radar, in its present state of development, was not applicable to railway conditions. One of the main difficulties with an installation in a locomotive is that radar measures only linear distances, and whilst a wide beam could be provided to overcome curvature to some extent, any obstruction—such as the side of a cutting—in a direct line with the beam would restrict the scope of the equipment. If an unrestricted radar beam could be transmitted, it would then be difficult to distinguish between vehicles on the same line ahead, and those on adjacent lines or sidings. Although no estimate can be made of the cost of a radar device it is understood that it would be much in excess of an A.T.C. installation designed to protect the same amount of traffic passing over the same track.

New Uses for Old Tenders

A USE has been found by the Louisville & Nashville Railroad, U.S.A., for the high-capacity 12-wheel tenders formerly attached to some 4-8-4 locomotives for fast freight service acquired in 1942-49 and now displaced by diesels. The 12-wheel tenders had a capacity for 22,000 gal. of water and 25 tons of coal; they have been converted in the railway's own South Louisville shops into oil tank wagons, with a capacity of 26,000 gal. and an empty weight of 63 tons. The original bogies, with roller bearing axleboxes and clasp brakes, have been retained. The tenders have been roofed throughout their length. Running boards and safety appliances have been fitted to normal box wagon standards. As rebuilt, they are among the largest tank wagons in existence. It is intended to use them to transport diesel fuel from commercial supply sources to railway shops and yards, where they will replace permanent wayside installations at outlying points. Supplies will be maintained by exchanging empty for full wagons as required. The expense of using privately-owned rented wagons is thus avoided.

Co-operation to Improve Riding

BEFORE the formation of the Office of Research & Experiment (O.R.E.) of the International Union of Railways at Utrecht, two investigators had been working independently on the influence of vehicle vibrations on the comfort of passengers. They were Monsieur Mauzin, of the French National, and Dr. Ing. Sperling of the German Federal Railways; and through the O.R.E. they were brought closer together. Their combined experience has resulted in a system of assessing vehicle performance on the track. This method and some of the results obtained by it are described in a paper presented to the Institution of Locomotive Engineers last week by Mr. J. C. Loach, Superintendent, Vehicle & Track Division, Research Department, British Transport Commission, Derby; the title is "A new method of assessing the riding of vehicles and some results obtained." Results are expressed in terms of "passenger comfort" on a time basis; this gives an idea of the number of hours after which the average passenger will begin to feel tired. This method of assessing comfort, which is being applied by the author to British Railways rolling stock, is an example of a practical outcome of international co-operation among European railways. In the face of increasing competition, it is obviously to the advantage of all railways concerned to profit from each other's experience, in this way, rather than follow the somewhat insular attitude sometimes maintained by former railway engineers. A summary of the paper is given on another page.

New Construction in India

SINCE the partition of India and Pakistan in 1947, there has been much railway building activity in the former. The lines completed, under construction, or planned can be classified according to their primary purpose: (*a*) economic development; (*b*) adjustment of the communications system to the creation of the Indo-Pakistan frontier; and (*c*) assisting traffic flows. Some new projects must combine two of these objects. The lines now building for economic development include, in Bengal and Bihar, various broad-gauge branches of the South Eastern (former Bengal-Nagpur Railway) in connection with the expansion of the iron and steel industry. They have been mentioned in this journal from time to time. None includes civil engineering work of very great difficulty, but they are built to convey a relatively dense mineral traffic demanding high standards of construction and maintenance. More in accordance with the traditional line built in India to open up agricultural country is the Cochin-Quilon metre-gauge line of the Southern Railway, which includes a great deal of bridging. Good progress is being made. In view of the dense population of the region served in what is now the State of Kerala (formerly Cochin and Travancore) it may be asked why this line was not begun long ago by the progressive South Indian Railway, which did so much to develop the port of Cochin. This seems to be a case where the present Government is readier to take risks than were the railway company and the Central Government and the Governments of the Province (Madras) and princely States concerned in the days of British control. There is always a financial risk in building a major line through a tract of country in India where there is little or no industry, and, consequently, a low standard of agricultural productivity and of living. Surveys have been authorised or are in progress of many lines with the same purpose—and notably one running south of Poona to develop the Konkan region of the State of Bombay. The metre-gauge Kandla-Deesa line of the Western Railway has opened up an arid district in the West, besides serving the new port of Gandhidham.

The principal line built as the result of the alteration in economic and railway geography occasioned by Partition is the metre-gauge Assam Link of what is now the North East Frontier Railway. It was constructed quickly to afford a direct railway route between Assam and Uttar Pradesh and the rest of India, avoiding Pakistan territory. Because of a northern salient of (Pakistan) Eastern Bengal, the line had to be taken through difficult country in the foothills of the Himalayas. Whether caused entirely by natural causes such as floodwater, or partly by the haste with which it was built, the line recently has been giving trouble in the form of washouts and other interruptions; re-alignment is being carried out in several places. Nevertheless, its construction in difficult conditions—when the Indian railways still were suffering from the shortages and dislocations resulting from the war, followed closely by political changes—was a great feat. One result of Partition has been a diversion of freight traffic from and to that part of the Punjab which is now in India, via the port of Bombay, instead of via Karachi. It has therefore been necessary to double part of the Central (former Great Indian Peninsula) Railway southwards from Delhi to Muttra and Agra. This work might also be considered as one designed to ease traffic flows.

Many new lines, including spurs and cut-offs and conversions from metre to broad gauge, have been or are being completed to facilitate the flow of traffic. The most important perhaps is the metre-gauge Khandwa-Hingoli link of the Central Railway, on which work is proceeding apace. This when finished will unify the two groups of metre-gauge lines in the north and south of the country. Construction of the line has long been considered, but was not begun before the war because of the adverse effect its building might have on the traffic over the G.I.P. broad-gauge lines to and from Bombay. A short avoiding line has been built to enable through east-west traffic to by-pass Moghalsarai marshalling yard—an indication of

the increased flow of traffic which gives rise to sufficient trainloads to warrant this work. More ambitious is the scheme to bridge the Jumna south of Delhi, to relieve the existing Jumna bridge and Delhi junctions and yards, and to give passenger trains from and to the east direct access to New Delhi. An important gauge conversion, from Gudur to Renigunta, on the Southern Railway, enables freight trains between Bengal, Orissa, and the East Coast on the one hand, and the extreme South and the West Coast on the other, to avoid Madras.

These are only examples of much that is being done. Despite the building of the Cochin-Quilon project, the indications seem to be that effort—especially as funds are restricted for development under the second Five-Year Plan—will be concentrated on lines in industrial regions, on doubling of main lines and on avoiding lines at traffic centres. The development of agricultural regions may have to wait—and some of the potential traffic may perhaps be handled adequately in the meanwhile by road, where road construction has progressed. On the other hand, the increased throughput of trains made possible by electrification and the introduction of diesel traction, and improvements in signalling, will lessen the need for doubling. Thus electrification of the busy Southern Railway metre-gauge line between Tambaram (near Madras) and Villupuram will avoid the need for doubling. Higher speeds mean better track; so that the civil and signal engineers will be kept busy for a long time.

The "Light" on the Line

ALL over the country at this time of year, five o'clock on Saturday evening is a time of solemn rendezvous with Sports Report on the B.B.C. Light Programme. Football enthusiasts might consider a railway journey, particularly a railway journey to see one's home team play an "away" match, to be one of the few legitimate excuses for missing the appointment. Reviewing this question in connection with a football excursion from Bath to Yeovil on December 7, the Public Relations & Publicity Officer's Department of the Western Region at Paddington had at their disposal a means of giving the excursionists the best of both worlds, for the Region's radio-equipped train, now being used for party outings after its summer cruising season in North Wales, enabled them to see the match and spared them the subsequent suspense of waiting until they were home again before knowing their fortune in the "pools." This solution was not only enthusiastically received by the Bath City Football Supporters' Club, which hired the train to see its team play Yeovil in the second round of the F.A. Cup, but also gained valuable publicity on B.B.C. television for the facilities which the train provides.

The special value of the radio equipment on this occasion lay in the fact that the departure from Yeovil Pen Mill on the return journey was at 4.30 p.m., before full results of the day's matches would be available in the evening papers. Accordingly "Sports Report" was received en route on the radio set in the specially-equipped van and broadcast over the loudspeakers in the seven coaches (including a cafeteria car) of the train. Two extra coaches had been added on this occasion, the occupants of which went forward into the radio train proper at 5 o'clock to hear the results, so that all the 454 members of the party knew the best or worst by the time they reached home. The novelty of the arrangements interested the B.B.C., who sent to Yeovil a cameraman, recording engineer and lighting assistant from London, and a reporter from the Bristol studios, to travel with the train and film the supporters on its return journey as they listened to "Sports Report."

Difficulties of the kind inevitable in planning an undertaking such as this were encountered, first when the B.B.C. reported at the last moment that it could not process the film and screen it from Bristol as expected, and then when it was found that there would not be a connection from Bath reaching London in time for the film to be developed and shown on the TV news that night. The project was saved when the Western Region had the happy idea of arranging for the train to stop at Westbury, and for a car to take a B.B.C. courier to Chippenham, where he placed the film on the up "Merchant Venturer" at 6.10 for it to reach Paddington at 8. This enabled the film to be shown at 10.30 p.m., and a successful enterprise was happily rounded off by the spontaneous appreciation of the radio train expressed by three travellers who had been interviewed, and by the B.B.C. commentator's tribute to the efficacy of the Western Region's arrangements for enabling the film to be delivered and developed in time for the programme.

Some details of the radio and sound equipment for the train supplied by the General Electric Co. Ltd. are given on another page. There is no doubt that its facilities will be equally appreciated on many other occasions. The distinguishing feature of the episode described is the very large number of potential travellers to whose notice these facilities were brought by appreciation first of the needs of the excursionists themselves, and then of the news interest which the arrangements held for the public at large.

Selling Transport

PUBLIC transport today has to work hard to sell its services, and a greater share of energy and attention must be devoted to the task of first capturing the business. In view of this, the paper read last month to the Scottish Section of the Institute of Transport, on selling transport, with particular reference to British Railways is of particular interest now that British Railways are making special efforts to increase their ability to sell freight and passenger transport. The author of the paper is Mr. S. E. Raymond, Chief Commercial Manager of the Scottish Region of British Railways.

British Railways were quick off the mark, he observes, in discerning the implications of the Transport Act of 1953. As a result of a review of the organisation of the Commercial Department in each Region, it was proposed in 1954 to appoint sales assistants to the Chief Commercial Managers and similar assistants to the District Managers and Superintendents. "A strengthened sales organisation has, therefore, existed in British Railways for some time now," Mr. Raymond states, and he adds that great benefit has been derived from the sustained efforts of these specialists who have co-ordinated and developed the work and activities of the commercial representatives, previously known as railway service representatives. How far he is right in these views still remains to be seen. The financial results published by the British Transport Commission do not as yet lend support to what seem optimistic views as regards British Railways. The new forms of traffic organisation that are being introduced in some of the Regions of British Railways and referred to in many previous issues of this journal, are also, he believes, a clear indication that organisationally British Railways are very much aware of the need to integrate the traffic function so as to place the maximum of emphasis on selling. Here again, it would be helpful to hear of concrete results, where new organisation has existed for some months.

Whereas previously the cost was decided by one department and the service by another, now the whole is in one hand. He is referring presumably to the hand of the traffic manager or equivalent officer in the new organisations. Surely, on any efficiently managed railway, the officers responsible respectively for cost and service have always worked closely together, and the one, guiding hand has been at a higher level. It is true, that, as he remarks, competitors of the railways often are organised in small units with local discretion, which must be matched by the railways with a flexible and personal organisation embodying the right degree of autonomy.

The flexibility of the new freight charges scheme, he explains, points inevitably to a devolution of authority, so that the management unit where decisions can be made is nearer the customer that must be served. Whilst it is too early to make any assessment of how the new railway merchandise charges scheme, which came into operation

on July 1, is working, and what contribution it can make to solving the problems which have bedevilled the economics of British Railways for a long time, Mr. Raymond is of the opinion that customers may take longer to get used to the new conception of railway charging than the railwaymen will take to learn how to use it. The idea that rates can be quoted for particular consignments, that there may be local variations, and that the principle of analogy no longer applies, will be hard for some customers to understand, after being used for so long to the tariff system of charging. We agree with him that it would be a pity if, at the same time as strenuous efforts are being made to decentralise management of British Railways and give more local autonomy, many customers were, because of the flexibility of the scheme, busily centralising their transport arrangements so as to compare notes.

The usual approach, in selling, is to focus attention on the product and leave much of the rest to the imagination. Mr. Raymond rightly points out that in the case of British railways, not only has there always been a healthy curiosity into their ways and equipment and services, but perhaps more than any other industry the railways have everything to gain from the understanding, confidence and, above all, the affection of their customers. The indications are, he believes—and we hope that he is right—that British Railways stand considerably higher in public esteem than they did in recent years. He is certainly right in stressing that the criticism to which they were subjected, to whatever extent justified, was bad for the morale of railwaymen and adversely affected the service given; but those who provide a service for a charge, cannot complain if the buyer criticises what he pays for—good morale often is the result of a sense of achievement.

Whether the modernised arrangements of the new charges scheme can be fully exploited until the modernisation plan is nearer completion, is doubtful. The large schemes in hand must take time to complete. Meanwhile, competition from other road and air transport is becoming more intensive. The seller of railway transport has to satisfy the customer today, and tomorrow, and next week, and to retain his interest in British Railways in the knowledge that if he can do so today, the service will go on improving as the fruits of physical modernisation are gathered.

Poor Freight Traffic Statistics

(By a correspondent)

THE twelfth four-week period of 1957 extended from November 4 to December 1, normally a time of heavy traffic forwarding. In the corresponding period of each of the eight years from 1949 to 1956, British Railways originated over 23 million tons of freight. Last year only 22,420,000 tons were put on rail, a decrease of 974,000 tons from 1956, or 4·2 per cent; and of about 1,480,000 tons, or 6 per cent, from 1953. As in the two previous four-week periods, the tonnage of all classes of traffic declined at an alarming rate. In 12 weeks from September 9 to December 1 the railways lost 2,720,000 tons of traffic, or about 4 per cent of their 1956 carryings. Merchandise accounted for 686,000 tons, or over 6 per cent, of the loss, while 583,000 fewer tons of minerals were carried, though the steel industry recorded fresh records in output. Industrial production generally kept on a high level, but did not prevent a decrease of 1,421,000 tons, or 3·4 per cent, in the quantity of coal and coke put on rail. It is understood that the disastrous decline in freight movement continued to the end of 1957.

Operating Statistics

The operating statistics reviewed below refer to 12 weeks to December 1, when the average length of haul for all classes of traffic was nearly two miles shorter than in 1956. British Railways worked 356,000,000 fewer ton-miles; this was a decrease of 6·8 per cent spread over all Regions and varied in intensity from 2 per cent in the Scottish to 6 per cent in the London Midland, 7 per cent in the Eastern, 7·9 per cent in the Western, and 8 per cent in the North Eastern. Freight train-miles were reduced by 804,000 (2·5 per cent) and train engine-hours by 164,000 (4·6 per cent). The speed of steam freight trains advanced from 9·12 m.p.h. in 1956 to 9·34. The low traffic volume brought the all-line average train load down by 7 tons to 153 tons. The regional reductions varied from a ton in Scotland to 11 tons in the Eastern Region, where the train load of 172 tons fell below the London Midland figure of 175 tons.

The output of freight train operation for the whole system, measured by net ton-miles produced in a train-hour, was 1,170, a decrease of 32 points (2·6 per cent). Though the Eastern Region worked 66 ton-miles fewer in a train-hour, its output of 1,393 was the highest, being 149 points above the North Eastern, 208 above the London Midland, and 333 above the Western result.

Movement, gauged by wagon-miles turned out in a train-hour, tells much the same story. The number of wagon loadings dropped by 520,000, or 6·8 per cent, to 7,131,000, but the decrease was due partly to a rise of quarter of a ton in the average wagon load at starting point for all classes of traffic to the record amount of 9·67 tons. The North Eastern contributed largely to that improvement by raising its average by a third of a ton, or 3 per cent, to 11·46 tons; it was the only Region to increase the merchandise wagon load, which at 4·5 tons was three quarters of a ton above the London Midland average. Loaded wagon-miles were down by 53,410,000 (7·8 per cent) and empty wagon-miles by 15,510,000 (5·4 per cent). In a train-hour wagon-miles averaged 219 for the whole system, compared with 226 in 1956. The hourly output varied from 247 in the Eastern Region to 229 in the North Eastern, 220 in the London Midland, 211 in the Scottish, and no more than 194 in the Western Region.

Railway Rolling Stock

The stock of steam locomotives was gradually reduced by 500 during 1957 until it stood at 16,988 on December 1, when 2,820, or 16 per cent of that number, were under repair. Over the same period 45 new diesel shunting engines (mechanical and hydraulic) went into traffic; at December 1 the number of locomotives of that type was 135, but 12 were out of action. In 12 months prior to December, the stock of diesel-electric locomotives increased by 142 to a total of 642. All but 23 of these diesels were assigned to shunting work; at December 1 no fewer than 75 were unserviceable. The resultant repair ratio of 11·6 per cent is excessive, as a comparison with the motive power position in the U.S.A. shows conclusively.

On December 1, the U.S.A. railroads owned 27,272 diesel units and had only 1,018, or 3·7 per cent, awaiting repairs. On the first day of the previous months last year the repair percentage varied from 3·4 to 3·8. It is remarkable that the railroads keep the great bulk of their diesels continuously at work, seeing that the units are combined to form locomotives which move on an average freight train loads of over 1,000 tons at a speed between terminals of 18 m.p.h. and run 140 miles daily. When assigned to passenger service, diesels attain an average speed of 40 m.p.h. and a daily mileage of 340. The intensive use of the diesel fleet is made possible by efficient maintenance, in which the locomotive builders frequently participate. It is significant that in December the railroads had 488 new diesels units on order and not a single steam or electric locomotive.

At December 1 our railways had a stock of 1,104,240 freight vehicles, of which 71,060, or 6·4 per cent, were under repair. That was an improvement on the position on September 8, when 84,790 vehicles, or 7·7 per cent of stock, were out of order, but compares unfavourably with a repair percentage of 5·6 12 months ago. The available operating stock on December 1 was 22,500 less than the number of serviceable wagons at a comparable date in 1956. In contrast, the U.S.A. railroads, with a repair ratio of 5 per cent, had nearly 20,000 more serviceable wagons than in 1956, but unhappily many of them were surplus to requirements.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Wheel and Rail Lubrication

January 14

SIR,—We were interested to read the letter from Brigadier R. Gardiner published in your November 22, 1957, issue.

Our Railway Superintendent, Mr. H. Wood, has suggested that your readers might be interested in the fact that the system of lubrication referred to in this letter was described and illustrated in your issue of January 11, 1935, in the article on lubricated check rails on the 2-ft. gauge Burma Corporation Railway. This system of lubrication continues to be used satisfactorily on our railway.

Burma Corporation (1951) Limited is the successor company of Burma Corporation Limited, and is a joint venture with the Government of the Union of Burma.

Yours faithfully,

E. H. TREGONNING
Director & General Manager

Burma Corporation (1951) Limited,
Namtu, Northern Shan States, Burma

Spanish Railways

January 3

SIR,—In the sub-title to the Spanish Railways article included in "Overseas Railways, 1957" (page 119), it was suggested that the rehabilitation and reconstruction programme of the Spanish National Railways has been made possible by American aid.

This is not the case. The American aid for this programme, although mentioned in several paragraphs of the article, has been scarce and late; it began only in 1951 with a short credit granted by the Export-Import Bank, and to date it amounts only to $40 million, a very small figure as compared with the $800 million already spent or allocated for this programme.

Moreover, as distinct from the benefits received by other countries, the lower American aid to our railways must be refunded in dollars or in pesetas, depending on whether these funds proceeded from the Export-Import Bank or from I.C.A. Therefore the important programme of reconstruction undertaken by the Spanish National Railways is due exclusively to the effort of the Spanish nation, sustained, certainly, under very hard conditions.

Yours faithfully,

JOSE M. GARCIA LOMAS
Vice Presidente
Red Nacional de los Ferrocarriles Españoles

Santa Isabel 44, Madrid

Monorail Connection with London Airport

January 24

SIR,—I was interested to read the article in your January 24 issue about the proposed monorail line to London Airport.

I understand that this would be on the same principle as the Listowel & Ballybunion line, opened in Ireland in 1888 and since closed, and that it will be supported on tubular concrete beams carried on concrete pillars, placed between, or outside of, the tracks leading from a South London Terminus. This seems an expensive arrangement, would be difficult to locate, and would cause much inconvenience when erecting. The line would have to be raised to a considerable height to clear other cross-over lines. Loading and unloading would be difficult, as it would probably have to be done from both sides of the train.

The chief point is whether the saving in time from the air terminal to the airport would be worth while, considering the time taken from other parts of London to the terminal. Passengers from Liverpool Street, for instance, would be little better off, and might as well do the whole trip by car or taxi, especially if they had arrived there by train.

Use could be made of the "Outer Circle" line, to which practically every main line and terminus is connected. Every terminus, and intermediate places such as Reading, Gloucester, Norwich, Nottingham and Rugby (to mention just a few) could be connected via Kensington Addison Road (Olympia) to Feltham, and thence, by a short branch, to the airport. Addison Road is not much further out than Earls Court, and trains to the airport could pick up there if desired. Southern Region main-line termini could also connect with Feltham. Nearly all track is existing, though some spurs might be necessary to avoid reversing. Diesel railcars would be the ideal form of transport, and could either run independently to the airport or could form trains on reaching the Circle Line. The service could run from the London termini as well as from the main lines.

Yours faithfully,

CHARLES F. CLEAVER

Brynawelon, Stoke Poges, Bucks.

The Outlook for Transport

December 23

SIR,—It must be wonderful to be as cheerfully optimistic as your correspondent Mr. R. Bell, whose letter on the U.S.A. transport situation was published in your issue of November 15, 1957. The state of the U.S.A. railroads, as outlined in an editorial article in that issue, is anything but reassuring. Passenger business is dying an expensive death. The more profitable grades of freight are following it fast. The New York Central and the Pennsylvania are planning to combine in an effort to keep going; the former has been compelled to scrap most of its quadruple trackage and has seen its crack passenger trains running half empty. All over the country there is a demand for higher charges to counteract the fall in freight tonnages. The roads are claiming 17 per cent of the total freight passing and how that proportion will go when the vast new highway programme gets under way is anybody's guess; but the effect, particularly on marginal operators, must be little short of catastrophic.

This leaves Mr. Bell unmoved. A few more steam locomotives have been scrapped in favour of diesels. It looks like becoming an exciting race to see whether the steam locomotive, the U.S.A. railroads, or only the railway passenger, disappear from the scene first.

Not that things are much better in Britain, where the only hope for survival lies in improving services and reducing costs. Electrification, even on the relatively simple third rail sections, is moving at a snail's pace. The humorously described "lightweight" trains appear to be getting heavier and heavier while their engines have to be more and more powerful and costly. It is true that they are handling more passengers, but their economic position, particularly in the more complex designs, remains obscure. With locomotive-hauled trains it is becoming clear even to the most obtuse that improved fast schedules are out of the question unless loads can be reduced appreciably or double-heading of diesels is resorted to, and what that will do to costs is nobody's business. Finally, in some of the more recent developments, we are being asked to wax enthusiastic over machines weighing in excess of 100 tons whose total output could be provided by one axle of a 20-year-old electric locomotive.

There is no doubt about the brightness of the prospects for road transport.

Yours faithfully,

L. IRVINE-BROWN

P.O. Box 711, Singapore

THE SCRAP HEAP

A Versatile Railway Chemist

As the "Dictionary of National Biography" gives no space to leaders in applied chemistry, a note of such men born in 1858 may make amends. . . . A chemist born a 100 years ago was Leonard Archbutt, who was trained under A. H. Allen of Sheffield and who also pioneered water-softening as inventor of the Archbutt-Deeley process. With his many papers published by the Society of Public Analysts he became noteworthy, yet such was Archbutt's versatility that as chief chemist to the Midland Railway Company he was author of a work on vacuum brakes as well as a standard book on lubrication.—*From "The Industrial Chemist."*

Bird's Eye View

They [airmen] also state that it would be very useful to them if railway companies would agree to paint the names of their stations on the roofs of the station buildings. . . Mr. Sopwith in his long flight into Belgium for the De Forest prize, quite lost himself, and flew on from place to place, endeavouring to read the names of the stations on the boards erected on the platforms. But he could not get low enough to do so. If there had been names on the station roofs, readable from the air, he would have been able to consult his map, and would have known at once where he was.

An excellent land sign for the airman, although it will not be sufficient when flying becomes general, is for the railway companies to whitewash the sleepers on lines leading to important centres. In the London to Manchester flight, for instance, the London & North Western Railway whitewashed the sleepers leading to Manchester at all points where there were a number of lines branching off in various directions, and both Paulhan and myself found this to be a most efficient guide.

Vedrines thinks this whitewashing of sleepers so excellent a plan that he declared, before the Circuit of Britain, that he would fly all round the 1,000-mile course, without a map or compass, if he could make certain of having the railway lines picked out for him in this fashion.—*From "With the Airmen," by Claude Grahame-White and Harry Harper (Henry Frowde, Hodder & Stoughton,* 1913).

C.P.R. Observation Cars in Italy

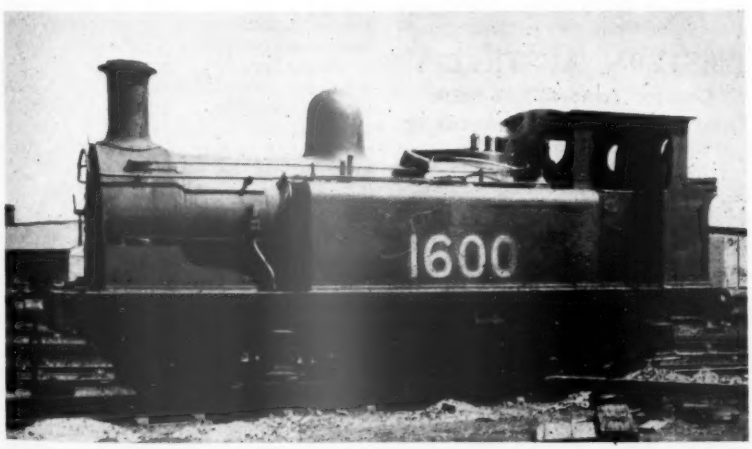
(*See our November* 8 *and* 22 *issues*)

A correspondent refers to the fate of the Canadian Pacific Railway observation cars which ran in Austria-Hungary shortly before the first world war. At the end of the war, having been captured from the Austrians, they were, he states, run regularly by the Italian State Railways in expresses between Rome and Florence, Rome and Naples, and Genoa and Ventimiglia, and occasionally between Milan and Venice and Milan and Tirano (for the Engadine via the Bernina Railway). A supplement was charged over the first-class fare. He adds that the cars ran very smoothly.

They were well patronised, but were drawn from service in 1923, and subsequently transformed into saloons for Italian State Railways officers and Government officials. Their dark green livery was changed to varnished teak, and their once graceful appearance spoiled by addition of roof tanks and alterations to windows.

L.C.D.R. Locomotive at Colliery

We are indebted to a correspondent for the accompanying illustration, which shows an old London Chatham & Dover Railway tank engine (L.C.D.R. No. 141) working at Haydock, near St. Helens, Lancs., last summer. It still bore its Southern Railway number, 1600. The locomotive was built at the L.C.D.R. Longhedge Works in 1879. It was withdrawn from service in 1936 and sold by the Southern Railway to Richard Evans & Co. Ltd., Haydock. Very few ex-L.C.D.R. engines are believed to be at work today.



Photo] *[J. B. Latham*

Former London, Chatham & Dover Railway locomotive now working for the National Coal Board at Haydock Park, St. Helens

Not Shutting Up Shop

(*The Director of Public Relations of the Baltimore & Ohio Railroad has sent us the following reply to A. B.'s verses in our December* 6 *issue, in which he referred to Mr. Alistair Cooke's allegation that the B. & O. was "seeking permission to shut up shop"*)

Canto the First

Shutting up shop! The deuce you say!
So that's the word from the U.S.A.?
Well, gentles all, we've got news for you,
Straight from the home of the "Royal Blue":
We're running a railroad, please note Mr. Cooke;
Running it with what we like to call the New Look,
Which includes C.T.C. and a Data-matic;
For each freight move will then be automatic,
With brand new yards and other facilities
To meet tomorrow's traffic possibilities.
(And, by the way, we learned some time ago
That there's nothing like a diesel to make a train go.)
It was, if memory serves, back in 'twenty-five
We ran our first
In the yard, and in 'thirty-five
First into passenger growlers burst.

Canto the Second

Shutting up shop! What a lot of rot!
Why, we're moving to a gallop from a trot.
And if, in the process, we trim a bit of fat,
Well, you can't really blame us for that.
(As you British say, you've got to be fit to be first at bat.)
You see, we've been around since eighteen twenty-seven,
And as we've no intention to enter Railroad Heaven,
We expect to be in business come twenty-two eleven.
(And just in passing, and not to be snide,
If the Jersey Turnpike ran through the Hampshire countryside,
British Railways' pride might take a mighty glide.)
In any event, this is all in fun
About a story from the whole cloth spun.
We're still in the business of hauling passengers
And we still have conductors who shout "Change cars."
From Baltimore west, we're still the best
And we invite anyone to make his own test.
By gum!

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Reduction in Fares

A scheme that will bring about a reduction of rail fares in some classes and will affect an area within a 45-mile radius of Johannesburg has been announced in Cape Town by the Minister of Transport, Mr. B. J. Schoeman. From February 1, only one class of accommodation for Europeans and two for non-Europeans will be provided in the area. The first class fare for Europeans and non-Europeans will be the same and will be on the level of the existing second class fares. Mr. Schoeman has stated that the reduction is being made as an experimental measure in the hope of attracting more passengers.

Passenger Terminal at Table Bay

The new £36,000 marine passenger terminal at F berth, Duncan Dock, in Table Bay Harbour, Cape Town, is a single-storey brick and concrete structure, with a staircase giving access to the roof which overlooks the dock. Walls and ceilings are panelled, and all signs are in plastic. Facilities include a restaurant, cloak rooms, telephone booths, a railway booking office, and a reception room staffed by the South African Railways tourist section.

EAST AFRICA

New Welfare Clinic

A new Asian maternity and child welfare clinic at Nairobi South opened recently, it is worked on a principle of co-operation between the Nairobi City Council and the E.A.R. & H. administration—an arrangement which obtains also with certain African clinics within the city. In pursuance of this policy E.A.R. & H. have already provided three clinics and three dispensaries, and the opening of the new Asian clinic brings the total of such amenities up to seven.

INDIA

Metre Gauge "Blue Train"

The North Eastern Railway is now running a through mail train between Kanpur (Cawnpore) to Siliguri (for Darjeeling), composed of uniform, azure-blue coaches and with improved amenities. It consists of 12 coaches, namely four third-class, two second and third composites, one first-class, one air-conditioned and first-class composite, one dining car, one mail van, and one third-brake composite at each end of the train. The distance is about 600 miles.

Revised Railway Estimates

The Railway Minister is reported to have announced recently that schemes under the Second Five-Year Plan were now estimated to cost Rs.1,425 crores (£1,068,750,000) instead of Rs.1,125 crores, and that they would not be affected by shortage of foreign exchange. One-third of the Rs.300 crores increase was necessary to meet rapidly-increasing traffic and the remainder to cover rising costs of wages and materials. It had been decided to construct a bridge across the Brahmaputra River at Pandu in Assam at a cost of some Rs.10 crores (£7,500,000) and probably consisting of 10 spans each of about 400 ft.

Progress on Khandwa-Hingoli Link

The second, 18-mile section of the Khandwa-Hingoli metre-gauge link of the Central Railway, from Hingoli to Kanhergaon, was opened recently for freight, passenger, and parcels traffic. Two intermediate stations were simultaneously opened. With the opening of this new section, which followed closely on the opening of the 18½-mile Khandwa-Takal section, there remains a 150-mile gap, from Takal to Kanhergaon, to be completed between the northern and the southern metre-gauge railway systems. The final link is expected to be completed in 1959.

VICTORIA

Fast Inter-State Freight Service

A new daily inter-State freight service now delivers general merchandise to Brisbane 56 hr. after despatch from Melbourne. The previous delivery time was four days. Improved transhipment at Albury, at the break of gauge point between the Victorian and New South Wales Railways, is reported to have been partly responsible for the acceleration. The total distance is nearly 1,200 miles. From Albury to Brisbane there is through running over the N.S.W.G.R. and the standard-gauge line of the Queensland Railways.

WESTERN AUSTRALIA

"Country Terminal" at Perth

Details have now been worked out by engineers for the remodelling of Perth and East Perth Stations, and the provision of a new "country terminal" to the south of East Perth Station. It is proposed to construct a country passenger terminal, to the south of the existing railway and situated between Lord Street and Claisebrook Road, Perth.

The station premises will consist of a multi-storey structure housing all W.A.G.R. administrative staff in the one building. Movement of Eastern and South-Western suburban passenger trains will be separated by a fly-over, while an overhead bridge will be provided at Claisebrook Road, east of the station.

Carriage sheds, and associated facilities, will be provided on the site now occupied by the East Perth Locomotive Depot.

Completion of the Welshpool marshalling yard and the work at East Perth will permit the removal of the present Perth station and freight yard. It will then be possible to lower the passenger and freight lines about 11 ft. below present track levels. Low-level overbridges will be constructed at William Street, Barrack Street, and Moore Street. A passenger station will be built opposite Forrest Place (the present station site), with access from a wide footbridge leading from Wellington Street across the railways and Roe Street to the proposed culture centre north of the station.

CANADA

Winter Work Programme

The Canadian National Railways are putting into effect a supplementary winter work programme in an effort to avoid further reduction of employment during the winter. This was decided in response to an appeal by the Federal Government to industry. On the railways, a rapid and continuing decline in traffic has aggravated the seasonal and other labour adjustments which can be expected to occur during the winter.

While this may add to the cost of such work, and make it more difficult to eliminate the deficit on the 1957 operations of the C.N.R., the management believes it prudent to avoid, as far as possible, the disorganising effects of mass short-term unemployement during the winter season. All supervisory officers have been directed to explore ways of organising supplementary work programmes in local areas throughout Canada, designed to keep the existing labour force employed.

The supplementary programmes now being put into effect will be additional to the accelerated programmes on capital account which were announced in December, 1957, to provide employment for some 600 men. This was made possible through advance approval by Government of a portion of the 1958 budget of the railway. No estimate can be made of the cost of the new programmes, but the nature of the work will, for the most part, be a charge to operating expenses.

UNITED STATES

Cutting N.Y.C. Passenger Service

The New York Central System has applied to the Public Utilities Commissions of Illinois, Indiana and Ohio to discontinue all passenger trains over its Big Four main line west of Indianapolis, and also between Toledo and Cincinnati. This would entail the abandonment of the through service between New York and St. Louis, in

which for many years the N.Y.C. has competed with the Pennsylvania Railroad.

In the 11 years from 1946-57, passenger patronage by N.Y.C. trains has declined 76·7 per cent between Indianapolis and St. Louis and 51·7 per cent between Toledo and Cincinnati. During the last decade the New York Central has spent $168,000,000 on new passenger equipment for its system-wide services, and $13,600,000 on advertising them, but has now accumulated a total loss of some $400,000,000.

The trains from and to New York which will cease to run through west of Indianapolis, if the petition is granted, will be the "Southwestern Limited," "Knickerbocker," "Missourian," "Cleveland Special," and "Gateway;" and between Cincinnati and Toledo the "Michigan Special" and "Ohio Special."

After the accident near Retiro terminus, Buenos Aires, when coaches of a derailed train hit those of a train travelling in the opposite direction

ARGENTINA

Serious Accident near Buenos Aires

One of the most serious accidents of recent years took place on January 10, when two electric trains of the General Mitre Railway were in collision at Cabin 2, between Retiro and Maldonado Junction. The first three coaches of a train from Delta to Retiro derailed at a crossover and hit the last three coaches of another train which had just left Retiro for Delta. Seven passengers were killed and 41 seriously injured. Damage to rolling stock, track, and especially signalling installations, was severe.

Train services were cancelled between Retiro, Colegiales, and Belgrano; long-distance trains started from and arrived at Colegiales, and an emergency bus service connected these points with Retiro. When traffic was finally restored, speed was restricted for several days at Cabin 2, as all installations were out of action. More than 10 days elapsed before services returned to normal.

An official investigation was instituted. The finding was that the accident was the result of a mistake of a signal fitter who, on being called by the signalman of Cabin 2 to investigate a slight irregularity in the working of the automatic signals, proceeded to bridge two relays with a copper wire, with the result that the signals returned to "line clear" while the route remained set from the main line to Retiro Goods Station.

On the General San Martín Railway, two days later, a local train from José C. Paz to Retiro ran into a siding on leaving Caseros and caused severe damage to the locomotive and to several wagons standing on the siding. The previous day a parcels train derailed at the Córdoba level crossing near Palermo, stopping all traffic for several hours as well as the tram and trolley bus services using the crossing.

Publications Received

Edinburgh Diesel Suburban Service.—The department of the Public Relations & Publicity Officer, British Railways, Scottish Region, has produced an illustrated brochure to introduce the new diesel railcars which will work certain Edinburgh suburban services from February 3. A series of diagrammatic maps is included outlining the five Edinburgh suburban lines over which the new diesel railcars will progressively run as new twin units are delivered and placed in service. Some features of the new vehicles such as power units, heating arrangements, and views obtained from the windows, are mentioned.

Kempe's Engineers' Year-Book, 1957. Vols. 1 and 2. 63rd edition. Morgan Bros. (Publishers), Limited, 28, Essex Street, Strand, London, W.C.2. 7 in. by 4¾ in. by 1¾ in. 1,324 pp. and 1,416 pp. Illustrated. Price (two volumes in case) 82s. 6d.—Alterations to this year's edition include the chapter on welding and cutting which has been rewritten to cover the various forms of arc welding, spark machining, oxygen cutting, and hardfacing, and so on. Revisions to text have been made to some other sections including iron and steel, non-ferrous metals and alloys, foundry practice; chapters on grinding and abrasives, and machine tools incorporate details of modern developments. The permanent way sub-section of the railway engineering chapter includes additional details of rail fastening devices. Throughout the volumes, the publishers have endeavoured to improve the layout of tables and formulae to make for easier reference.

Viscous Panels for Air Filtration.—A catalogue has been issued by Vokes Limited, Henley Park, Nr. Guildford, Surrey, dealing with oil-wetted filters produced by the company. Efficiency figures are quoted for tests on electric and diesel-electric locomotives for various designs of filter media. Details of the construction and applications of these filters are also given.

Bestobell Packings.—A brochure recently issued covers the range of products manufactured by Bell's Asbestos & Engineering Limited, Bestobell Works, Slough, Bucks. Packings produced by the company include lubricated fibrous, unlubricated yarn, lubricated yarn (asbestos and non-asbestos), and proofed cloth (asbestos and non-asbestos) types. Copies of the brochure may be obtained on application.

Scottish Region Party Organisers' Guide, 1958.—This well-illustrated booklet of 40 pages has been produced by the Scottish Region of British Railways, and contains suggestions for trips by train, or combined train and steamer, or coach tours, as well as descriptions of many places of interest. Details regarding the hire of a television train for party outings are also included. Copies of the booklet are obtainable from any British Railways office.

Holidaymaking, 1958.— A wide variety of resorts and countries is offered in the 1958 overseas holiday programme of Thos. Cook & Son Ltd. and Dean & Dawson Limited, covering the Continent of Europe, Canada, and the U.S.A. As in previous years, very complete arrangements have been made for rail travel, including meals, between the Continental ports and holiday resorts. The Italian holiday resorts featured in this programme include several on the Adriatic.

Evaluation of Riding of Passenger Coaches

Recently developed method gives numerical results facilitating direct comparisons

A METHOD of assessing the riding characteristics of passenger coaches, results from which are obtained in a form by which direct comparison may be made, has been developed. This method, which is being applied by British Railways was described by Mr. J. C. Loach, Superintendent, Vehicle & Track Division, British Railways Research Department, Derby, in a paper presented to the Institution of Locomotive Engineers on January 23. The substance of the paper, entitled "A new method of assessing the riding of vehicles and some results obtained," appears below.

Previous Methods

Previously, in this country, research into the question of vehicle riding had been mainly by comparing recordings made by instruments, such as the Hallade recorder or Cambridge accelerometer. These were usually compared visually; but when the records gave "average" appearance it was difficult to detect differences between them.

The new method is based on expressing riding qualities in terms of passenger comfort, and owes much to the work of Monsieur Mauzin of the French National Railways and of Dr. Ing. Sperling of the German Federal Railway, who studied the effects of vibrations on "passengers."

Through the organisation of O.R.E. (Office de Récherches et d'Essais) of the International Union of Railways (U.I.C.) the two investigators compared their results, found they were in reasonable agreement, and averaged them; these form the basis of the new system. Fig. 1 shows how the Mauzin-Sperling curves compare with curves produced by other workers who have had similar interests.

In the present devlopment of the method the data obtained from a record of carriage riding is converted into the amount of time before which an average passenger in a coach will experience a sense of fatigue, in terms of hours. The great advantage of the method is that the result obtained from a test takes the form of a numerical value based, quite logically, on the parasitic movements of the vehicle tested; the fact that a value is numerical means that it can be compared with values similarly obtained on other tests.

Because in all carriage riding, factors involved include track features and the components of the vehicle, it is desirable to record relevant particulars about the track such as whether it is straight or curved, and the amount of super-elevation. These can be obtained with a track-recording coach. It is also desirable for the vehicle under test to be the last in the train and the screw coupling between it and the next vehicle to be loose so that there is no contact between the buffers when running; then the vehicle under test has the maximum possible freedom of movement. But the method can equally well be used for a coach running between others in the normal way.

In a bogie coach at least four electrical accelerometers are normally placed on the floor of the vehicle to measure vertical and lateral accelerations. The signals are suitably filtered as interest normally lies in frequencies below 5 c.p.s.

Method of Analysis

It should be noted that it is not the absolute value of an acceleration but the variation of acceleration which is regarded as the chief cause of discomfort at frequences of vibrations normally encountered.

The variations in acceleration are of an oscillatory nature. It is necessary to sketch the line representing the mean value on the record obtained so that the maxima and minima of the recorded curves have the most even distribution.

Each record is regarded as being of sine-wave form, and it is the maxima and minima of the waves of the record, relative to the mean line which are the subject of analysis.

It is usual to consider for analysis the records obtained on a length of track, ½ mile or, if possible, one mile, where

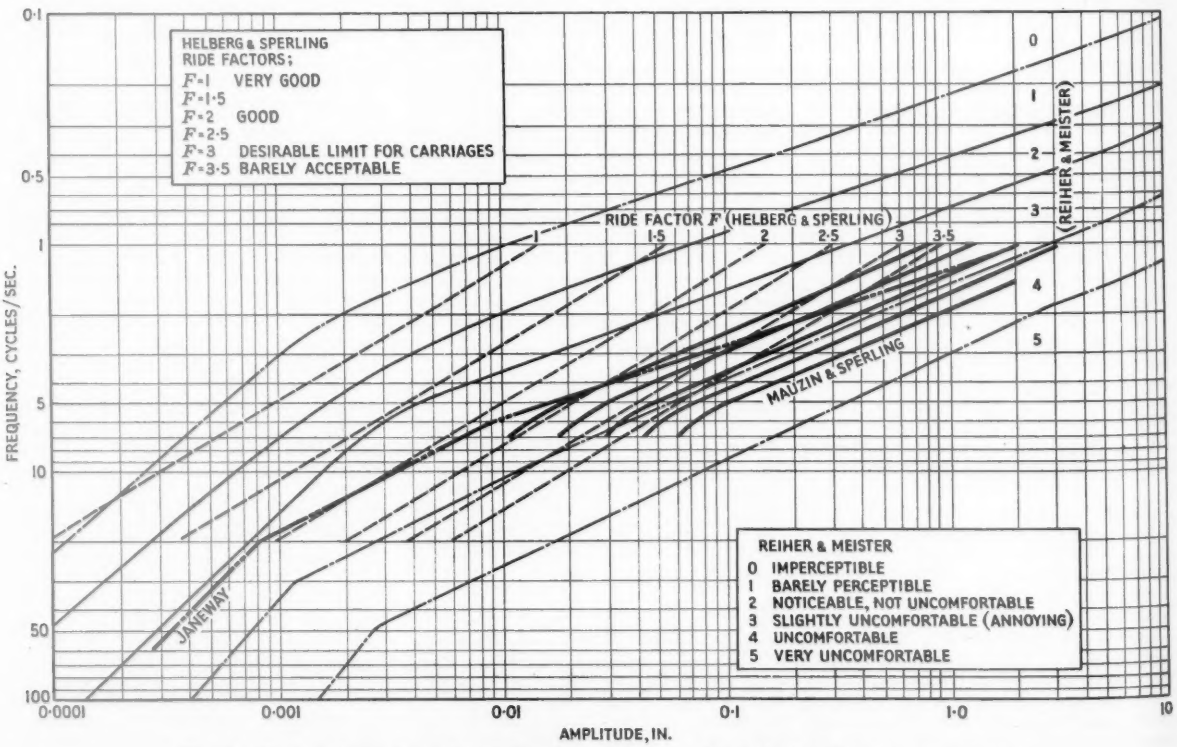


Fig. 1—Comparison of results of investigations into effect of vibrations on passengers

conditions of speed and track are as uniform as possible.

After having drawn the line of mean value, the record is then examined as in Fig. 2. Here the maxima and minima values occur at A_1, A_2, A_3, . . . and the ordinates are γ_1, γ_2, γ_3, . . . respectively. Each peak value can be associated with a half oscillation $B_0A_1B_1$, $B_1A_2B_2$, $B_2A_3B_3$, . . . which occur during the intervals of time B_0B_1, B_1B_2, B_2B_3, . . . Each half oscillation is approximately sinusoidal so that the frequency can be found.

The ordinate values of A_1, A_2, A_3, . . . are read in a convenient unit of acceleration which, for a few minutes, may be regarded as $\Delta\gamma$.

It is a case of obtaining the numeri-

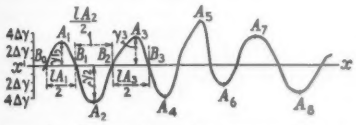


Fig. 2—Procedure for measuring a record as described in the text

cal statistical distribution of the values of acceleration in ranges ("steps") of $\Delta\gamma$ obtained on the test length.

M. Mauzin and Dr. Sperling have adopted metric units when giving a value to $\Delta\gamma$, but in f.p.s. units the value of 1 ft./sec.^{2} is very convenient and has been adopted by the author. In this way, four or five ranges are usually sufficient to accommodate all the accelerations recorded on a vehicle with average riding qualities.

The frequencies of the oscillations are also obtained and, at first, it might look a formidable arithmetical problem to consider both magnitude and frequency of each oscillation on the record. However, it is found that the variations of frequency of a group of oscillations appearing on a section of the record are slight even though the oscillations are of different magnitudes; thus for quite a number of consecutive accelerations the frequency is approximately the same and deviations from the average obtained in this way are not important for practical purposes.

Assessment of Data

From the calculations it is possible to derive a single figure which represents the comfort value of the ride. This may be done by two sets of curves: either curves of equal comfort, or curves of equal fatigue. The latter, a numerical value for comfort, is developed from the concept of a certain degree of fatigue being felt after an average person has been subjected to oscillations for a period of time.

After explaining the theory of the procedure, the author gives details of an example taken from an actual record worked in three ways: in the first method, a full analysis is made; in the second, the frequencies in each range of accelerations are averaged; and in the third—which is a still greater approximation than the second—the frequencies in the whole test are averaged.

The similarity of the results shows that the third method, which saves a considerable amount of time and labour, is normally sufficiently accurate: interest usually lies in the order of the results rather than in their exact value. Differences between the results obtained from first and third methods are rarely more than 5 per cent and frequently only differ slightly from each other.

A preliminary glance at the record gives an indication of the regularity of the wave-cycles occurring; one or other of the methods is then chosen according to the approximation which may be accepted and to the accuracy of the result required.

Graphical Representation

M. Mauzin and Dr. Sperling have suggested a method of showing a result graphically. A graph having as abscissa distance, and as ordinate values of the reciprocal of the period of time before the onset of fatigue ($^1/\tau$) obtained for each range of acceleration involved is plotted: and for ease of comparison of graphs of this type, the distance along the horizontal axis, representing the total length L of track, is always on the basis of 1,000 metres and distances obtained in the analysis of the record are proportioned if necessary (Fig. 3).

They have suggested that the ordinate

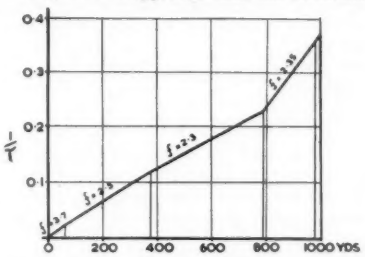


Fig. 3—Mauzin-Sperling graphical presentation of result

for $^1/\tau_1$, $^1/\tau_2$, $^1/\tau_3$, . . . occurring in each section l_1, l_2, l_3, . . . should be erected in the *middle* of the appropriate section. Then the summits of the ordinates are joined by a line, the area between it and the horizontal axis being *approximately* inversely proportional to the Comfort Riding Factor obtained from the test.

The author has adopted a similar graph based on 1,000-yd. length of track, but plotted in block form; Fig. 4 shows the same results plotted in this way, and it is considered easier to appreciate accurately the proportions of the lengths of the ride to be associated with each range of acceleration values. At the same time, the area under the stepped bounding line is *accurately* inversely proportional to the Comfort Riding Factor obtained from the test.

It is useful to know that a standard of riding of a carriage regarded as adequate by an "average" passenger corresponds to a period τ of 6 hr.

The same method could also be applied to freight vehicles though, in this case, a test would primarily be conducted for consideration of stability of the vehicle and of protection of the freight from excessive accelerations. The quality of a ride of a wagon may be regarded as adequate if the period τ is 45 min.

During the short period the author

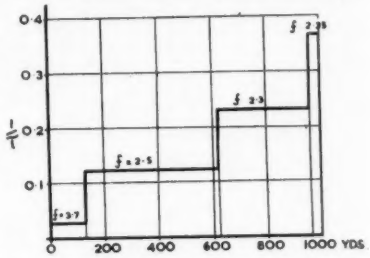


Fig. 4—Graphical presentation of result as developed by the author

and his staff have been using this method of assessing carriage riding, the results obtained have included tests on coaches loosely coupled at the rear of a train. These coaches have been of standard B.R. design with double-bolster bogies, just out of works following a general overhaul; tyres were turned to standard profile (1 in 20 coning of tread). All test sections were one-mile lengths of straight track, class "A" main line. The Comfort Riding factors obtained are shown graphically in Fig. 5.

Experimental Tyre Profiles

This method of assessing carriage riding has also been used in an experiment made on two trains with B.R. double-bolster bogies running between Euston and Liverpool in the London Midland Region: in one train all coaches had tyres turned to the standard (1 in 20) profile; in the other all tyres were turned to an experimental 1 in 50 profile.

Riding tests were made on two coaches, one near the middle of each

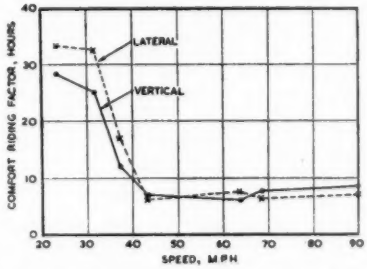


Fig. 5—Effect of speed on Comfort Riding Factor for B.R. coach

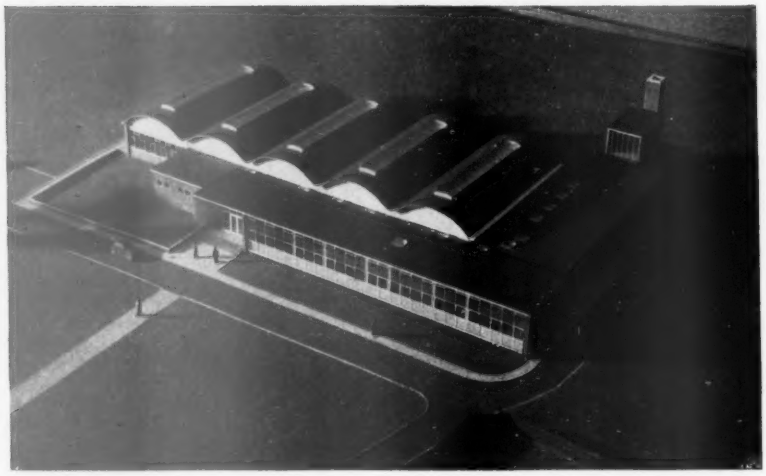
train, while travelling over sections of plain track.

The author stated that the prime purpose of giving results in his paper was to illustrate the value of this

(*Continued on page* 132)

Works Training School at Horwich

Final phase of scheme of educational facilities in London Midland Region



Model of works training school to be built at Horwich, showing the five-section workshop and surrounding accommodation blocks

THE first works training school on British Railways was established at Derby Locomotive Works and was officially opened by Sir Robert Burrows, Chairman of the former London Midland & Scottish Railway in December, 1947. After nationalisation of the railways, it was decided by the British Transport Commission that the general pattern of practical and theoretical training such as that at the school at Derby should be developed and extended to the larger workshop centres wherever practicable.

Accordingly, schemes were put in hand to cover all the main works of the London Midland Region; the Works Training School at Horwich represents the final stage of this enterprise.

Apart from the importance of Horwich as a railway centre, at which educational and vocational training facilities are both desirable and necessary, it is also essential to attract boys of high quality to maintain the quota of apprentices in the works and to ensure that adequate replacements are available for the skilled craftsmen who are lost each year through retirement and other causes.

Planning of School

The conception of the Horwich Training School scheme is that of Mr. E. J. Larkin (now Director of Work Study at the British Transport Commission), and its subsequent development the work of Mr. J. F. Harrison, Chief Mechanical & Electrical Engineer of the Region. The building was designed by Mr. H. H. Matthews, formerly Regional Architect.

In planning the scheme, developments under modernisation have been taken into consideration and there will be no difficulty in introducing adjustments to the curriculum to cover changing requirements. The authority of the Commission for the Horwich Training School to be built was given in March, 1956. It is anticipated that the building will be completed in July, 1958.

Design of Building

The school is being erected on an open site adjoining the main entrance to the works. The best features of modern training school design have been embodied in the scheme and the experience obtained at the other works training schools on the London Midland Region has been of great assistance.

The school will be a single-storey building, consisting of a large workshop with five main sections; each section will be under the supervision of an instructor. Around this will be accommodation for the Chief Instructor, Lecturer and main administrative facilities. Provision is also made for two general classrooms, a science room, and cloakroom amenities.

The aims of all London Midland works training schools are similar, and may be briefly summarised as covering trade training as well as education in the broadest sense to encourage the trainees to develop into useful citizens. The training scheme at the Horwich School will give preliminary practical and theoretical instruction to all apprentices, upon engagement at the age of 15, for one year. Approximately two-thirds of the time in the school will be spent on practical work and the remainder on theoretical work.

The school will have provision for training 70 trade apprentices for Horwich Works each year and, in addition, a number from other technical departments. Intakes will conform to the leaving dates of the schools in the Horwich area, and will be three a year. Accordingly, one-third of the total annual requirements of the works will be started each school term.

Responsibility of Staff

All matters of policy, subjects to be taken, detailed curriculum, instruction to be given, layout, and all relevant matters, will be the responsibility of the Chief Mechanical & Electrical Engineer, Derby. The day to day running of the School will be the responsibility of the Works Manager, to whom the Chief Instructor and his staff will be responsible. The Chief Instructor will be responsible for the selection of apprentice trainee applicants on behalf of the Works Manager.

Evaluation of Riding of Passenger Coaches

(*Concluded from page* 131)

method; nevertheless the results from this trial are of significance.

Tests made on the trains both when fresh from shops, and after 65,000 (and recently after a further 70,000) miles of running, indicate that with the flatter coning the standard of ride laterally is improved in many cases: in fact, in the case of the 1 in 50 profile, the lateral Comfort Riding Factor appears to be maintained after these periods in use, and the onset of bogie hunting has been deferred until, at least, after 135,000 miles of running. With the standard profile, however, bogie hunting sometimes occurs, with consequent poor riding characteristics, even after only 65,000 miles in service.

Engineers in Western Europe are agreed that the values of Comfort Riding Factors obtained from a test indicate quite well the general impressions of riding performance as noted by observations in the carriage while under test; and this has been confirmed from the author's own experience.

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London Bypass Route for Freight Traffic

Scheme to provide free movement on the Oxford-Cambridge outer ring line: improvement of connections to main routes

SOME 10,000 wagons a day are transferred from one Region of British Railways to another in the London area, moving across the city between trunk lines originally built to converge on London but not necessarily to connect with one another. Many cross-London connecting lines have narrow tunnels, steep gradients, and sidings so short that the length of trains is severely limited, moreover, they cannot be used at passenger peak hours. Measures have been taken, particularly since nationalisation, to reduce the number of wagons passing through London, but the cross-country connections outside London are not well developed and are of limited capacity.

A study of inter-Regional railway freight services has shown that significant relief could be afforded to cross-London freight movements if the cross-country line between Cambridge and Oxford were to be more fully developed, and the connections which it gives with all the main north-south railway routes were to be improved.

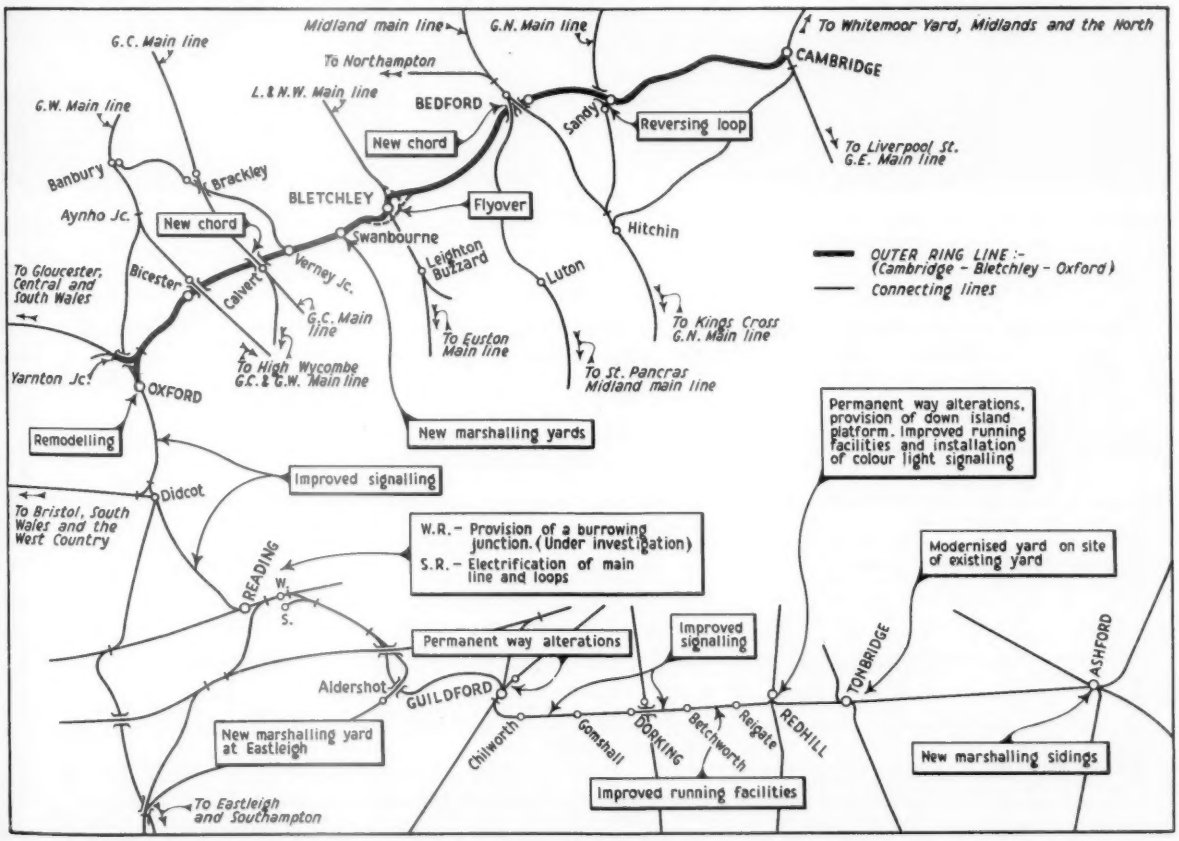
This line connects with the East Anglian lines at Cambridge, passes over and connects with the main Kings Cross-Doncaster line at Sandy, passes under and connects with the main St. Pancras-Derby line at Bedford, crosses the main Euston-Crewe line by level junction at Bletchley, connects with and passes under the Marylebone-Sheffield line near Calvert, and at Oxford affords connections with the Western Region routes which also give access to the south-west division of the Southern Region. Research has shown that it will be possible to divert daily more than 30 trains each way to this route, much of the traffic coming from the St. Pancras and Euston lines, including a very large proportion which now passes through London.

The bypass route has been given high priority in the modernisation plan for British Railways, but there is much that must be done before the concept as a whole becomes a working proposition. The principal new works required comprise a new double junction at Bedford between the main line and the diversionary route, a flyover over the main Euston lines at Bletchley, a new curve to and from the Marylebone-Rugby line at Claydon, remodelling at Oxford, resignalling between Oxford and Reading and a "burrowing junction" at Reading. A new marshalling yard at Swanbourne, west of Bletchley, is also contemplated as an integral part of the scheme. Such a new yard would receive trains from and for Sheffield and the East Midlands; Peterborough and East Anglia; Eastleigh, Portsmouth, and Southampton; South Wales via Severn Tunnel Junction; Crewe, Lancashire, and the North; and York and the West Riding. It would afford opportunities for long trunk runs, giving great advantages over the present unavoidable "pillar-to-post" working.

Bletchley Flyover

One of the most important features of the whole project, and one of the first to receive attention, is the provision of the flyover viaduct at Bletchley where the Oxford-Cambridge line crosses, at a level junction, the main line from Euston to the Midlands and the North-West. When this line is electrified under the modernisation plan, main-line trains will be travelling at considerably higher

(*Continued on page* 135)



The Oxford-Cambridge outer ring line and its connections with radial routes from London

Second Class Prototype Open Saloon for British Railways

Birmingham-built coach with individual reclining seats and fluorescent lighting

THE last of 14 prototype passenger vehicles to be built for British Railways has recently been delivered. Constructed by the Birmingham Railway Carriage & Wagon Co. Ltd., the coach is a second class open saloon; it has been placed in service in the Southern Region.

This prototype has been built to British Railways basic dimensions and standard design. The proportions of the bodyside windows have been amended, however. The exterior of the coach is in accordance with the standard livery colouring and the numerals for the carriage numbering are of modern design.

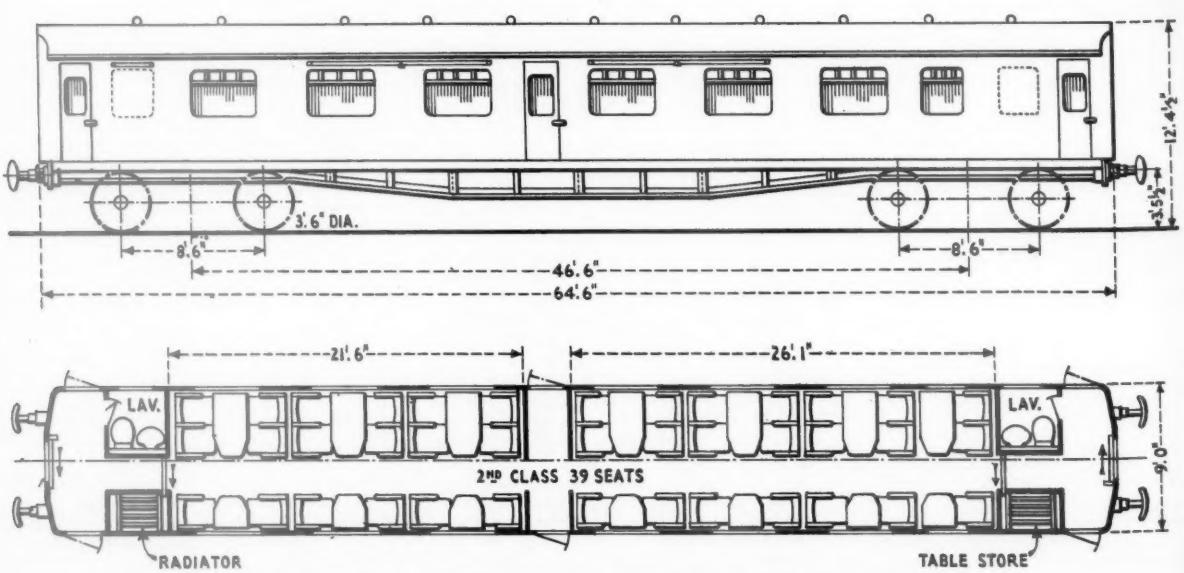
Double-Glazed Windows

The shell of the vehicle has been specially treated and double-glazed windows incorporated to give quiet running, increased insulation and avoid condensation. The coach retains the standard arrangement of two saloons divided by a central gangway, with a vestibule and lavatory at each end. The seat spacing has been designed to give increased comfort and the coach has acommodation for 39 passengers.

On one side of the coach the seats are two-passenger units, but each has been designed to give the passenger individual comfort by providing a separating central armrest. Single seats are fitted on the other side of the compartment. Upholstery is in foam rubber throughout and is a green and black material from a new range by

Double-glazed windows, individual reclining seats and removable table in open saloon of coach

View from vestibule, showing parcel racks and design of ceiling



Elevation and plan of second-class Birmingham-built prototype coach

Tibor Limited. The passenger may select an upright or reclining position by pressing a button. Readily detachable tables, storage and luggage space are incorporated in the design.

Veneer Panelling

Olive ash veneers are used for the interior finish of passenger saloons; they are stated to compare favourably for appearance and wear with the more recently developed synthetic finishes. The tables, also of olive ash to match the interior, are covered with plastic of special design and fitted with stainless steel legs. The vestibules are finished in light mahogany and the finishing of the centre gangway matches the saloon interior while a map is provided in the centre gangway for the convenience of passengers.

Ventilation is provided in the roof by extractors which draw the air through a continuous series of slots in the centre fluted ceiling panelling. Sliding ventilators are fitted over the windows. Spring-controlled blinds of decorative hair material are provided at double-glazed bodyside windows. A special type of spring-controlled ashtray is housed in the window sills. The luggage racks are of tubular construction finished in anodised aluminium.

Continuous steam heating fittings, covered with decorative grilles, are provided along both sides of the saloons. The vestibules and lavatories are also heated.

Lighting

Lighting in the main saloon is provided by continuous fluorescent tubes housed in the ceiling and illuminating the saloon through a continuous louvred aperture. Fluorescent tubes continue across the centre gangway illuminating it through a horizontal louvred opening in the inner ceiling.

The floors of the saloon are covered with a granite coloured linoleum; those of the gangways and lavatories are covered with decorative plastic tiling.

Lavatories are designed with the aim of tidiness and simplicity of maintenance, and are finished in laminated plastic and with thermoplastic tiled flooring suitably coved. A partially-recessed panel picked out in the colour scheme contains fluorescent lighting, a mirror, combined interleaved towel dispenser, and trigger-operated ashtrays. A distinctive feature is the wash basin which is fitted with a Unatap spray nozzle tap.

The interior arrangement and décor were designed by Sir Hugh Casson.

The principal sub-contractors are as follow:—

Bodyside double-glazed windows and sliding ventilators	Beckett, Laycock & Watkinson Limited
Reclining seats	Pel Limited
Washbasins	Adamsez Limited
Fluorescent lighting	J. Stone & Co. (Deptford) Ltd.
Unatap spray mixing tap	Walker, Crosweller Limited
Limpet asbestos insulation	J. W. Roberts Limited
Interior veneer panels	Edmonton Panel Co. Ltd.

London Bypass Route for Freight Traffic

(*Concluded from page* 133)

speeds and will thus need bigger headways. At the same time, the diversion scheme will produce a much higher density of traffic over the Oxford and Cambridge line. These two factors will make the existing flat junction even more of a hindrance to satisfactory train operation than it now is, and the provision of a flyover is essential.

The diversionary route for the flyover will start immediately west of Fenny Stratford station and will rise gradually until the proposed new viaduct is reached. This will cross the main lines just south of Bletchley station. The line will then fall steadily and eventually connect with the Oxford line near the present Flettons signalbox.

An equally essential part of this scheme is the diversion to the cross-country route of considerable traffic which is now flowing along the main lines through Bletchley. To attempt to continue to pass this through the level junction would involve too much interference with the trains on the trunk route. Another diversionary route has therefore been planned which will leave the main lines about a mile north of Bletchley station and rise gradually until it connects with the flyover just before it crosses the main lines. In this way the traffic to be diverted can be side-tracked on to the diversionary route and crossed over the main lines without causing any interference with movement on them. This second diversion, in fact, constitutes the equivalent of part of a "clover-leaf" such as is advocated for crossings of busy main roads.

In planning the route of these diversionary lines and the disposition of the viaduct, the utmost care has been given to avoiding, wherever possible, interference with other industry and residential property in the neighbourhood. Such a course involves more disturbance of the railway track and equipment, but this has also been kept to a minimum. Where disturbance of existing railway equipment is inevitable, the opportunity is being taken to make replacements in the way which will best conform to the eventual development of the full plan. For example, some of the carriage sidings to the south of the station will have to be displaced; they will be resited on the north side of the station, thus simplifying and reducing the station movements involved in getting empty stock into them. To move these carriage sidings to the north side, however, it is necessary to remodel the marshalling yard; the remodelling will in turn make for simplified shunting and train movement. The scheme will also involve some disturbance of the goods shed and staff buildings; new buildings of the most modern kind will be erected to replace them. Thus the scheme will bring in its train a number of improvements not directly connected with the flyover itself, but all contributing to greater efficiency of railway working at this important centre. The cost of the flyover and the consequential works is estimated at £1·6 million.

Traffic Movement

This flyover junction at Bletchley is only one part of the scheme, but it is one of the first essentials. As such it will play a great part in bringing freer movement to a very large volume of freight traffic in the complex metropolitan area. Moreover, by freeing the flat junction at Bletchley from the present-day cross freight traffic it will do much to speed movements both on the main lines and over the branches.

Other flyovers are planned elsewhere to relieve congestion. Among those already announced are one at Rugby and one at Euxton, between Wigan and Preston. These two schemes, which together will cost some £1·4 million, are designed to remedy black spots, to avoid slowing down high-speed movement on the main lines and to keep traffic moving on the secondary routes.

TENTH BRITISH ELECTRICAL WORLD POWER CONVENTION.—"Electricity and World Progress: Britain's Contribution" has been selected as the theme of the tenth British Electrical Power Convention, which will be held at Brighton on June 16-20, under the presidency of Sir George Nelson. As in former years, an electrical exhibition will be held in conjunction with the convention; it will be opened by the President on the evening of June 16. The first session will be held in the Dome on June 17 when delegates and their friends will receive a civic welcome from the Mayor of Brighton. Sir George Nelson will then deliver his presidential address. In the afternoon a paper on "The Development of Nuclear Energy for Electricity Supply in Great Britain will be presented by Sir Christopher Hinton, Chairman of the Central Electricity Generating Board. Next day's proceedings will begin with an address on "The Development of Nuclear Energy for Electricity Supply Overseas" by Sir Claude Gibb, Chairman & Managing Director of C. A. Parsons & Co. Ltd. "Britain's Part in Electrical Development Overseas," will be the title of the paper in the afternoon of June 18 by Mr. H. J. Beard, a partner in the firm of Messrs. Merz & McLellan. On June 19 a paper, "British Hydro-Electric Plant and World Power Requirements," is to be presented by three members of the staff of the English Electric Co. Ltd.—Messrs. J. C. Beverley, E. G. Teasdale, and A. Wilmot. In the evening the Convention annual dinner and dance will be held in the Corn Exchange. The Electrical Forum, at which a team answers questions on electrical matters, forms the concluding session of the Convention on the Friday morning. This will be followed by the annual general meeting.

Reconstruction of West Blyth Staiths, North Eastern Region

Specially designed pre-cast, pre-tensioned multiple box-girder decking

Lining up of concrete web units

RECONSTRUCTING the West Blyth staiths is one of the major schemes of modernisation now in progress in the North Eastern Region of British Railways. The work has been undertaken to make the staiths capable of carrying the new standard 24½-ton mineral wagons and also modern diesel shunting locomotives.

The staiths, 800 yd. long and brought into use in 1928, are used, in the main, for coastwise shipment to the South of low grade coal for use in power stations; approximately 1½ million tons are shipped every year. The substructure was completed in 1915 and is maintained by the Blyth Harbour Commission, but the superstructure, completed in 1926, is owned and maintained by British Railways.

There are two berths, each equipped with three shipping appliances. Two of these are electric belt conveyors (a high conveyor and a low conveyor) for use alternatively according to the height of teem required by the ship. The third is a telescopic gravity spout which serves, in the main, as a standby appliance if, for any reason, a conveyor cannot be used. These appliances are fed from hoppers located below the upper decking of the staiths. The conveyors have a shipping speed of between 500 and 800 tons an hour and can swing laterally through an arc of 12½ deg. covering a distance of 20 ft. at the delivery end. At the second of the two berths there is a Hancock anti-coal-breaking device. Vessels up to 12,000 tons deadweight can be accommodated at the staiths.

The existing superstructure consists of timber trestles founded on piles and these carry the waybeams on which the rail track is laid, and also a timber decking.

Design of Staiths

The staiths are constructed on a rising gradient and a simple gravity system of wagon movement is in operation. Loaded wagons are propelled along what is known as the "pushing up" road on the west side of the staiths which opens out into four standage sidings at the seaward end. They gravitate back over the hoppers into which they are discharged through bottom doors. The empty wagons then gravitate into the "empties" sidings located at the landward end of the staiths.

After a survey carried out in 1954, in which the bearing capacity of the piles was tested under greatly increased dead and live loads, it was decided that when the waybeams and timber decking became due for renewal in 1956, the opportunity could be taken to strengthen the superstructure to carry the heavier rolling stock mentioned above.

The reconstruction involves: (*a*) repairing the timber trestles, and (*b*) re-decking, mainly in concrete slab—to carry a sleepered track, and in place of the timber waybeams—this being the most economical form of construction appropriate.

The re-decking, now being carried out, is in pre-cast, pre-tensioned concrete units of an unusual and interesting type. They have been produced by Dow-Mac (Products) Limited, of Tallington, Stamford, Lincs., to the design and specification of the Chief Civil Engineer, North Eastern Region of British Railways. In the main the units are of two types, both of multiple box-girder section. The concrete webs are extended at each end of the units to form interlocking teeth. One type of unit has three centre teeth and a half tooth at each side; the other unit carries four teeth. The units are laid alternately so that the teeth interlace to form a continuous deck.

This particular design of unit has been adopted because of the variations in spacing between trestles and the curvature of the approach spans at the landward end of the staiths. The design also allows the full depth of the units to resist the very high value of shear at the bearing. The box section reduces dead weight. Altogether 3,600 tons of concrete units are to be used, including 680 track-carrying units weighing approximately 4¼ tons each.

Units, basically similar to the two main types, but embodying slight modification of design, are being used where large variations are found in the trestle spans and also where the construction depths available are small, as in the case of the "flyover" where the "pushing up" line passes over the "empties" line. Destruction tests were carried out at King's College, Newcastle, to confirm the basic assumptions made in the design.

Programme of the Work

The work is being carried out in two stages, the first of which is now nearing completion. This has consisted of repairing the timber trestles, stripping the timber decking and replacing it with concrete units under the "pushing up" line and one siding. This work has involved the staiths being out of use for six months. The lightest six months of the year, viz., May to November, were selected, so that traffic normally using the staiths could be accommodated temporarily at the north and south staiths, also owned by British Railways.

On completion of Stage 1, it would be possible to bring one berth into commission, but, for construction purposes, it is not proposed to do so unless this should be essential.

Stage 2 consists of re-decking the remainder of the sidings as well as the area on which the offices, etc., are located. The "empties" road on the east side of the staiths is not required to carry the heavier loads, and so is to be re-decked in timber.

No ballast will be used when relaying the railway track. Sleepers are to be laid directly on the concrete decking and will be secured against lateral movement by longitudinal timber trimmers, bolted into holes pre-cast in the deck.

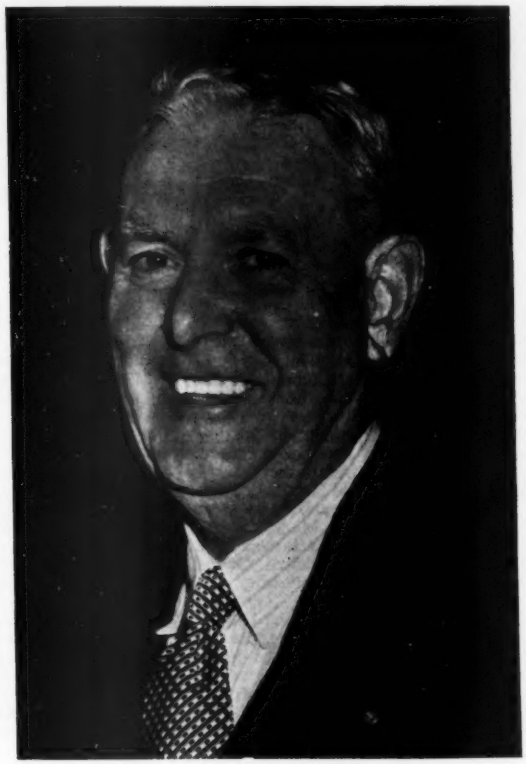
The re-decking is being carried out by Dowsett Engineering Construction Co. Ltd., of Gateshead, and the whole of the work is due for completion today (January 31).

RAILWAY NEWS SECTION

PERSONAL

Eng. Francisco R. Llusá, Deputy Chief, Way & Works Department, General D. F. Sarmiento Railway, Argentina, is a member of a mission which has left Buenos Aires for Paris, Prague and Moscow. Among other things, the mission is interested in buying railway equipment in those areas. Other countries visited may include Roumania, Poland, Hungary, Jugoslavia, and Eastern Germany. During February another Argentinian mission will visit Japan at the invitation of the Japanese Government. This will be led by Eng. Dante Ardigo, President of the Argentine State Railways, and other officials of that system.

Mr. J. H. P. Hawtrey
Chief Civil Engineer, Crown Agents, who receives the C.B.E.



Mr. D. J. Howse
Chief Traffic Manager, New South Wales Railways, 1948-58

Mr. J. H. P. Hawtrey, M.I.C.E., Chief Civil Engineer for the Crown Agents for Oversea Governments & Administrations, who, as recorded in our January 10 issue, has been awarded the C.B.E. in the New Year Honours List, was born in Moscow in 1905 and educated at Eton and the City & Guilds Engineering College. He took his degree (B.Sc.) and became an A.C.G.I. in 1927, in which year also he joined the Burma Railways as Assistant Engineer. He served on the open line in various localities and took part in the restoration of the main line after the 1937 flood damage. In 1940 he was released for active service and was commissioned into 603 Railway Construction Coy. R.E. with the rank of captain. He was engaged on reconditioning the derelict Shropshire & Montgomeryshire Railway for military use. In 1941 he was recalled to Burma for civilian work and became Executive Engineer, No. 3 Division, on the survey and construction of the Burma-China rail link between Lashio railhead and Kunming in the Yunnan Province of China. The location had reached Salween crossing at about mile 80 and some 15 miles of earthworks were complete when in April, 1942, the Japanese advance stopped further work. From 1942 until 1944 Mr. Hawtrey served as a major with the R.E., commanding 151 Indian Railway Construction Coy. I.E. He was engaged on the construction of Rangapahar (Manipur Road) railhead, the Pandu-Gauhati doubling, and the construction of the marshalling yard at Pandu Ferry Terminal, all on the Bengal-Assam Railway. During this period he was mentioned in despatches. From 1944 to 1945 he was with the Civil Affairs Service (Burma), a paramilitary organisation for the administration of re-occupied Burma. In 1945 he was appointed District Engineer at Pyinmana and later moved to Mandalay, where he was engaged on the rehabilitation of Burma Railways. In January, 1948, Mr. Hawtrey retired from service on that system and joined the staff of the Crown Agents in October the same year to undertake surveys and prepare designs for the remodelling of the Lagos (Iddo), Ibadan, Zaria, and Jos stations of the Nigerian Railway. In 1950 he transferred to general duties in the Civil Engineering Department and, in 1955, was promoted to be Deputy Chief Civil Engineer. He was appointed Chief Civil Engineer in 1956.

Mr. D. J. Howse, Chief Traffic Manager, New South Wales Government Railways, who, as recorded in our January 17 issue, is retiring today (January 31), is one of the best-known railway officers in the Commonwealth of Australia. He started on his career at the age of 15 with the Great Western Railway of England in 1908. He later emigrated to Australia with two brothers, intending to go on the land. The urge of railway service proved too strong, and all three men took up railway careers with the New South Wales system. Mr. Howse served on the Southern and Western Regions for many years and has been in a responsible position at Sydney Station for 25 years, the last 10 as Chief Traffic Manager. He began his career as a porter, and became successively Night Officer, Clerk, Inspector, and Special Officer. In 1940 he was seconded to the Army Department and later to the Commonwealth Transport Board as Director of Transport. He was subsequently loaned to Tasmania for over two years during part of which period he served as General Manager of Tasmanian Railways. Mr. Howse has regularly attended numerous local government, primary and secondary industry organisations and is a well-known figure at the annual conferences of such bodies as the Farmers and Settlers Association, Pastures Protection Board, Agri-

Mr. A. Philip

Appointed Assistant Regional Establishment & Staff Officer, Scottish Region

Mr. C. V. Barrett

Appointed District Operating Superintendent, Norwich, Eastern Region

Mr. D. Beattie

Appointed District Commercial Officer, Norwich, Eastern Region, British Railways

cultural Conference at Hawkesbury Agricultural College. He has been a member from its inception of the Secondary Industry Committee, State Wheat Committee, and, later, of the Grain Elevator Board. He is a member of the Institute of Transport, London, and a Past President of the New South Wales Section of that body. He has been a member of the Australian & New Zealand Interstate Railways Conference since 1934. He received the Silver Jubliee Medal in 1935 and the Coronation Medals of 1937 and 1953. He has served as a member of the Concord (Sydney) Municipal Council and has been Mayor and Deputy Mayor.

Mr. A. Philip, District Operating Superintendent, Glasgow (North), Scottish Region, British Railways, who, as recorded in our January 3 issue, has been appointed Assistant Regional Establishment & Staff Officer, Scottish Region, began his career with the London & North Eastern Railway at Aberdeen in 1927 as a trainee telegraphist in the Traffic Superintendent's department. In 1931 he was transferred to the Locomotive Superintendent's department, and, in 1942, was appointed to the District Traffic Superintendent's Office, Aberdeen, where he was engaged on staff work. In 1945 he was transferred to the Divisional General Manager's Office, Edinburgh. In 1947 he received an appointment in the Joint Staff Section, Superintendent's Office and, on nationalisation, became Deputy Staff Assistant to the Operating Superintedent, Scottish Region, Glasgow. In 1951 Mr. Philip was appointed Staff Assistant to the Operating Superintendent, Scottish Region, and, in 1955, District Operating Superintendent, Glasgow (North), the position he now vacates.

Mr. C. V. Barrett, Assistant District Operating Superintendent, Cambridge, Eastern Region, British Railways, who, as recorded in our January 24 issue, has been appointed District Operating Superintendent, Norwich, under the new Eastern Region traffic organisation, was educated at Archbishop Holgate's Grammar School, York, and began his career with the L.N.E.R. in the Goods Manager's Office at York. After Head Office and station experience in the North Eastern Area, he was appointed a Traffic Apprentice and trained in the Scottish Area. A period of special duty followed, including investigations into the movement of coal in the Edinburgh area and the distribution of rolling-stock, mainly in the Southern and Northern Scottish Areas. Mr. Barrett was appointed Assistant Yardmaster, Frodingham, in 1934, and subsequently became Assistant Yardmaster, Doncaster, and Yardmaster at Frodingham. He was appointed Assistant District Operating Superintendent, Cambridge, in 1941.

Mr. P. G. Price

Appointed District Goods Manager, Manchester, L.M. Region

Mr. Wilfred Heywood

Railway Superintendent, Manchester Ship Canal Company, 1947-58

Mr. G. Hubert Jones

Appointed Railway Superintendent, Manchester Ship Canal

Mr. D. Beattie, Assistant District Commercial Manager, Derby, who, as recorded in our January 24 issue, has been appointed District Commercial Officer, Norwich, in the new traffic organisation of the Eastern Region of British Railways, was educated at Lincoln County School and began his career in the L.N.E.R. in 1936. He obtained experience at Lincoln Goods Station until 1940, when he became a Lieutenant in the R.N.V.R. and served on convoy escort work and in the Normandy landings. In 1946 he was appointed a Traffic Apprentice and trained at Darlington, Middlesbrough, Newcastle, and York. In 1950, he moved to the Development Section of the Commercial Superintendent's Office at Glasgow and, in 1951, was appointed Goods Agent, Shieldhall. In 1952 he became Cartage Assistant to the District Goods and District Passenger Superintendents, Glasgow, and, in 1955, was appointed Assistant District Traffic Superintendent, Inverness. He became Assistant District Commercial Manager, Derby, in 1956.

Mr. P. G. Price, District Goods Manager, Bolton, London Midland Region, British Railways, who, as recorded in our January 17, issue, has been appointed District Goods Manager, Manchester, joined the London & North Western Railway in 1918 in London. After experience at stations and headquarters he served successively as Goods Agent at Dudley and Burton-on-Trent, later becoming Assistant District Goods & Passenger Manager at Bristol and Derby, and Assistant District Goods Manager, Leeds. He was appointed District Goods Manager, Bolton, in 1952. Mr. Price was one of the headquarters team which in the 1920's carried out initial experiments with containers before their general adoption. He later took part in the development of country lorry services and railhead distribution schemes on the L.M.S.R. On the opening of the Derby School of Transport in 1938 he was one of the first 50 students to attend. He is a member of the Institute of Transport.

Mr. Wilfred Heywood, Railway Superintendent, Manchester Ship Canal Company, who, as recorded in our January 10 issue, has retired, entered the company's service on December 12, 1905, and was seconded in March, 1906, as a junior clerk to the Chief Traffic Superintendent's Department at Head Office. In 1907, he was transferred to the Railway Section where he worked in the clerical department for eight years before being transferred to Railway Outdoor Operations in 1923. In 1934 he was appointed Chief Assistant to the Railway Superintendent becoming in turn Assistant Railway Superintendent (1942) and Railway Superintendent (1947). Mr. Heywood was a Club cricketer of some note in his younger days and played for Weaste Cricket Club. He is still an enthusiastic student of the game and is a member of Lancashire County Cricket Club. He is also a keen supporter of both Manchester Soccer Clubs.

Mr. G. Hubert Jones, Assistant Railway Superintendent, Manchester Ship Canal Company, who, as recorded in our January 24 issue, has been appointed Railway Superintendent, began his career as a junior in the Railway Department of that company 37 years ago. After gaining experience in the company's commercial and operating departments, he became Personal Assistant to the Railway Superintendent in 1934 and General Assistant in 1947. He has been Assistant Railway Superintendent since 1953. For a number of years Mr. Jones was a lecturer in commercial subjects at evening classes organised by the Manchester Education Committee.

Mr. M. Harbottle, Assistant District Engineer, Perth, Scottish Region, British Railways, has been appointed District Engineer, Inverness.

Mr. H. M. Herbert, Secretary to the Scottish Area Board of the British Transport Commission, has been appointed Assistant to the Chief Operating Superintendent, Scottish Region, British Railways.

Mr. W. Margreaves, Assistant to the District Passenger Manager, Leeds, North Eastern Region, British Railways, has been appointed Assistant District Passenger Superintendent, Leeds.

Mr. R. D. Gardiner, Assistant Divisional Motive Power Superintendent, Derby, London Midland Region, British Railways, has been appointed Assistant Divisional Traffic Manager, Nottingham Area.

Mr. Allan Yeaman, M.B.E., J.P., M.Inst.T. District Traffic Superintendent, Inverness, Scottish Region, British Railways, since 1940, who was awarded an O.B.E. in the New Year Honours List, was elected a Member of Inverness Town Council in 1943 and served until 1949. He was elected Bailie in 1945 and served in that capacity until 1949. He was awarded the M.B.E. in the New Year Honours List of 1946 for services in transport of stores and personnel for the Royal Navy, then based on Scapa Flow. He was appointed Honorary Sheriff Substitute for Inverness-shire in 1946, Justice of the Peace for Inverness-shire in 1951, served on Inverness-shire National Health Executive Council as Secretary of State's representative, March, 1950, to March, 1956, and is a member of Inverness Chamber of Commerce, of which body he was President for the year 1947. Mr. Yeaman is a Member of the Institute of Transport, and Member of Inverness Rotary Club. He was appointed Chairman of Inverness-shire Savings Committee in June, 1948, and to the Scottish Savings Committee as Northern Area representative in 1949.

The London Midland Region of British Railways announces the following appointments:—

General Manager's Department

Mr. L. A. Metcalf to be Assistant (Administrative) to General Manager, with effect from January 20, 1958.

Director of Traffic Services

Mr. R. Tildesley to be Assistant Divisional Traffic Manager, London, with effect from January 20, 1958.

Mr. R. D. Gardiner to be Assistant Divisional Traffic Manager, Nottingham, with effect from January 6, 1958.

Commercial Officer

Mr. H. A. Mugliston to be District Goods Manager, Liverpool, with effect from January 13, 1958.

Operating Officer

Mr. A. F. Fielding to be Assistant Divisional Operating Superintendent, Derby, with effect from January 1, 1958.

Commercial Officer/Operating Officer Joint

Mr. A. Higginson to be District Traffic Superintendent, Barrow, with effect from January 20, 1958.

Chief Mechanical & Electrical Engineer's Department

Mr. G. W. Parkin to be Electric Traction Engineer, London, with effect from January 1, 1958.

We regret to record the death on January 21, at the age of 56, of Mr. Jack Hampson, Chief Buyer of Leyland Motors Limited.

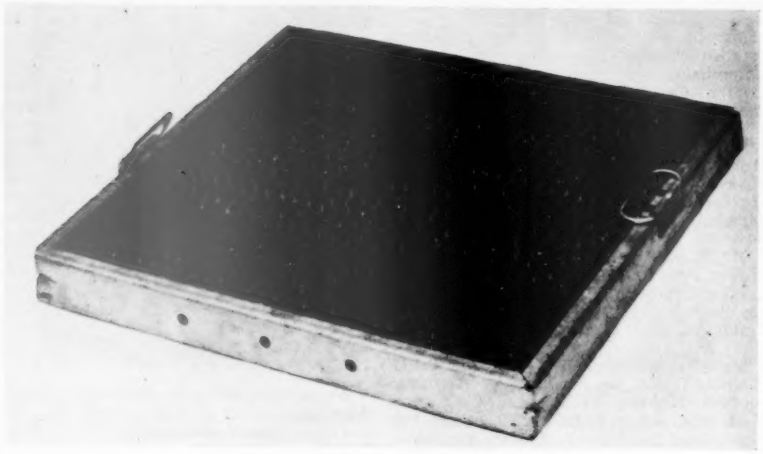
We regret to record the death, at the age of 71, of Mr. Percy Syder, who served with the old Great Eastern and London & North Eastern Railway Companies for 43 years. Mr. Syder was London City Manager of the L.N.E.R. for 14 years before his retirement. He also was for nine years on the Council of the London Chamber of Commerce. He had been a member of the Institute of Transport.

Following the relinquishment by Mr. John Donovan of his appointment as a Member of the Management Board & Chief Labour Officer, British Transport Docks, the British Transport Commission announces that Mr. F. J. Norris, Staff & Establishment Officer, British Transport Waterways, has been appointed Staff & Establishment Officer, British Transport Docks. The Commission also announces the appointment of Mr. T. Birkett, a full-time officer of the Transport & General Workers' Union & Secretary of the Employees' side of the National Joint Council for the Inland Waterway Industry, as Staff & Establishment Officer, British Transport Waterways.

We regret to record the death of Mr. Roger Waterlow Sewill, C.B.E., M.Inst.T. He was educated at Tonbridge and Clare College, Cambridge. In 1922, after war service, he became Managing Director of the London & Southern Counties Transport Co. Ltd., a position he held until 1935. In 1939 he was appointed the first Chairman of the Road and Rail Central Conference—he had been a member of the R.H.A. since its inception in 1931. He served as one of the Association's two Vice-Chairmen in 1932 and as Chairman in 1933, 1934, and 1935. In that year the R.H.A. was merged with Associated Road Operators Limited and Mr. Sewill became Director of the latter association. He was also a Founder Member of the British Road Federation, a member of the Advisory Consultative Committee on the Government Road Haulage Scheme set up by the Minister of War Transport, and of the Road Haulage (Operations) Advisory Committee. He was Joint Chairman with Mr. A. E. Sewell (railway side) of the Road & Rail Central Conference. During the last war, when the road hauliers' traffic pool was formed, Mr. Sewill was seconded to act as General Manager of the pool. He resumed his duties as full-time Director of Associated Road Operators Limited when the war-time pool was ended in 1943, and, in 1945, when the Road Haulage Association was formed, he became Director of that body. In July, 1948, he became National Consultant to the Association and resigned from this position in December the same year.

We regret to record the death on January 20 as the result of a car accident of Mr. J. P. A. Meldrum, a Director of Metropolitan-Vickers Electrical Co. Ltd. Mr. Meldrum, who was 55, had served with the Metropolitan-Vickers Company for more than 30 years. He was born in 1903 and educated at Rugby and Glasgow University. After a vacation apprenticeship at Metropolitan-Vickers in 1924, he joined the company as a college apprentice in 1926, later becoming a special switchgear trainee. In 1930 he was appointed to the staff of Switchgear Engineering Department. During the war he served in the Royal Corps of Signals as a lieutenant-colonel, was awarded the O.B.E. and mentioned in despatches. Soon after returning to Trafford Park he was appointed Sales Manager, Switchgear Department. In 1953 he became Manager, Home Sales, and, in 1955, was elected to the board. He became Sales Director in January, 1957.

NEW EQUIPMENT AND PROCESSES



Air Filtration Equipment

TWO designs of air cleaning and gas filtration equipment which have been in use in the U.S.A. are now available under licence in this country. They are known as the Far-Air and Rotonamic filters; a private exhibition was arranged last week for the purposes of demonstrating the equipment.

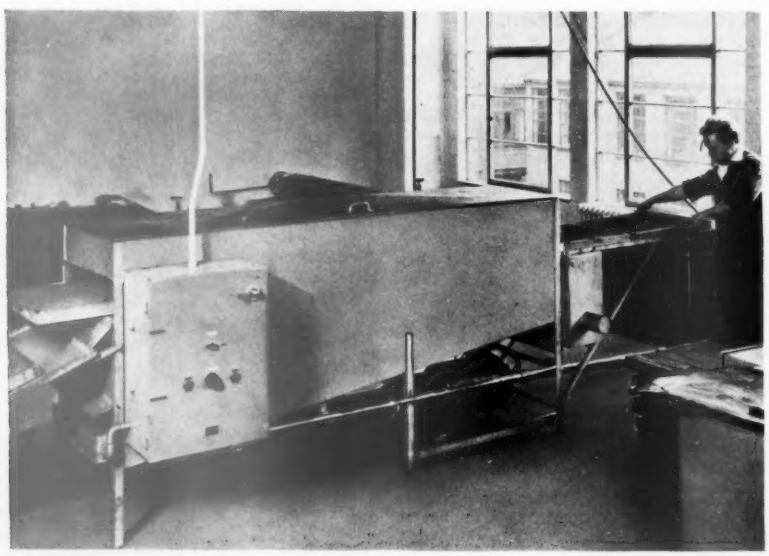
The Far-Air filter is of the viscous impingement type and can be applied to locomotive panels as well as road vehicles, stationary plant and so on. An installation in the Midlands has shown an overall air cleaning efficiency of some 99 per cent, a saving of 82 per cent of the previous air-cleaning cost.

These filters operate on the labyrinth principle; this is that airborne solids will continue to travel in a straight line while the air streams in which they are carried can easily be diverted.

Each filter consists of alternate strips of herring-bone-crimped wire cloth or gauze sandwiched between flat (uncrimped) strips of wire gauze. These strips, 2 or 4 in. wide, are assembled into pressed metal frames of appropriate thickness, with the lengths and breadths corresponding to a range of standard sizes. An assembly of these single filters can be held in an interlocking frame and thus comprise a filter bank of large area through which atmospheric air can pass. Each filter is treated, before use, with a special mineral oil of a type which produces high wicking and adhesive tendencies without odour.

Special sizes can be produced for particular applications, for example, diesel locomotives.

When airborne particles impinge on the adhesive oil, they remain trapped, and the air is clean by the time it traverses the filter. Filters of cellulose tissue are also available; these can be used in conjunction with the metal fabric filters, fitted into the same frames, to give removal of solids in the range up to 10 microns dia.



Viscous Filter Cleaning Unit

AUTOMATIC washing and centrifugal oiling units for viscous filters are also to be produced under licence by the manufacturer. The equipment, also known as Far-Air, is designed for one-man operation and has a capacity of 55 filters per hour. It can recondition any make of this type of filter besides the Far-Air type.

The operator places the dirty filters on the in-going conveyor and removes the clean filters from the drain rack. The cleaned filters are then immersed, in the oiling machine, in hot oil, centrifuged of excess oil and removed. They are then ready for immediate use.

The washer has a three-stage operation: first, the loose, surface dirt is flushed away; second, a hot, alkaline solution under pressure is forced through the filters from the top and bottom from several angles, washing away dirt and oil; third, clean water is forced through the filters to wash away all traces of the alkaline solution. This flushing is important, as improper rinsing would promote corrosion, reduce filter life and contaminate the oil.

The alkaline solution is recirculated and used over and over again. Each charge will clean approximately 150 filters.

Another advantage claimed for the unit is the small space required. For the washer this is 2 ft. 6 in. × 18 ft. 8 in. including a 5-ft. 8-in. conveyor and 5-ft. drain rack; the oiler requires 4 ft. 9 in. × 4 ft. 7 in.; with the usual working space around each unit.

The washer conveyor is geared to travel 21 in. per min., which means that one 20 in. × 20 in. deep-clean filter emerges approximately every minute. The oiler requires approximately four minutes to complete the cycle for immersing and centrifuging four filters.

Steam coils are available through the manufacturer at nominal extra cost. All necessary heat controls can be supplied.

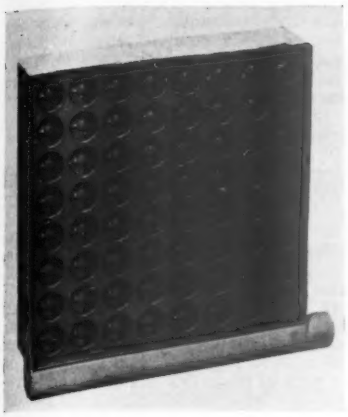
The installation of the equipment requires external plumbing connections to water, drainage system and heat source. The washing machine is shown in the accompanying illustration.

Self-Cleaning Filter

THE Rotonamic air cleaner is simple, has no moving parts and requires no maintenance, because of its self-cleaning property. Under certain circumstances, for example, diesel locomotives and road vehicles, the solids are ejected by means of the exhaust gas system; for some plant it may be necessary to collect the solids in a hopper, which would be required to be emptied as required.

Helical blades mounted in a panel give the air a whirling motion in its passage through the panel. The sudden acceleration and whirling moment centrifuge solids out of the air stream into comparatively still air, where the solids fall out of suspension to be aspirated away.

In the U.S.A. some 3,500 of these units have been installed in diesel locomotives; they occupy a similar space for their capacity to the Far-Air viscous pattern.



which both show an increased efficiency, it is claimed, over conventional oil impingement type filters.

By way of example, a 20 in. × 20 in. × 4½ in. Rotonamic panel assembly comprises 64 cyclonic type separator units arranged in parallel. This size assembly is capable of handling between 1,000 and 2,000 c.f.m. depending on the available pressure.

The incoming unfiltered air enters each intake tube through deflecting vanes that produce the high velocity vortex. The dust particles are centrifuged outward in the intake tube and accelerating cone and are carried by the bleed-off air through an annular orifice into the dust discharge hopper.

The main air flow, still whirling, reverses direction and travels toward the inlet around the outside of the discharge tube providing the second cyclonic action. The cleaned air flows through the discharge tube and into the engine air intake manifold.

Laboratory tests are said to indicate that this design functions efficiently in the lowest to the highest dust concentrations. Efficiency averages 98 per cent on particles in the critical 5 to 15 micron range, specific gravity 2·5, and is even higher on larger sizes. The appearance of a typical Rotonamic filter panel is seen in the accompanying illustration. For American diesel locomotives special adapter kits have been supplied for replacement of conventional existing filter sections.

Full details of the three foregoing equipments, the Far-Air and Rotonamic filters, and the filter cleaning units, may be obtained from the manufacturer in this country, Intermit Limited, Bradford Street, Birmingham, 5.

Compact Self-Priming Pump

A DESIGN of all-purpose pump which has a good output performance compared with its size and power has been produced. Known as the Goodyear pump, it operates on a "screw" principle and makes use of modern synthetic rubber bonding techniques.

Its large suction enables the pump to deal with air and liquid in any proportion, while its simple positive action and low fluid velocity enable it to deal easily with viscous fluids.

The pump is continuous, self-priming, and self-lubricating in principle. It is a positive axial-flow unit employing a screw (rotor) which engages with a rotating plate to produce a pulseless action that is virtually positive.

The rotor is supported rigidly on a shaft on taper roller bearings which, to retain the lubricant and to exclude foreign matter, are fully protected by lip seals.

The symmetry of design allows the rotor to turn in either direction, thus altering the direction of flow.

Mechanical face seals, running on ground and lapped faces, seal the shaft; a chamber between the seals and the bearings is fully vented to atmosphere.

A feature of the pump is the complete absence of metal-to-metal contact; all engaging surfaces are rubber-to-metal, lubricated by fluid. This reduces frictional losses to a minimum and results to some extent for the high efficiency and long life of the pump.

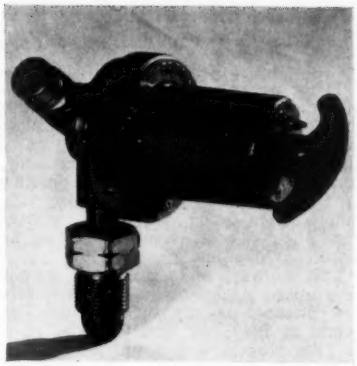
A special fully automatic relief valve is supplied where shut-down valves are incorporated on the delivery side, automatically lifting at the pressure selected. In the event of a valve being closed against the pump the whole of the output is recirculated to the suction side without damage to the pump or prime mover. The relief valve is also fitted with a lever for hand operation.

Three sizes of the pump, with 1¼ in., 1½ in. and 2½ in. suction and delivery connections, requiring prime movers of from ⅓ to 16 b.h.p. are at present envisaged. They cover a range of outputs from 4½ to 16 gal. per min. against heads of from 50 to 200 ft. As an example, the 1½ in. pump which weighs 11 lb. can deliver 31 gal. per min. against a 200-ft. head at 3,000 r.p.m., requiring a prime mover of 3·1 b.h.p. An efficiency of 61 per cent is stated to be achieved with this design of pump.

Full details of the Goodyear pump can be obtained from the manufacturer, Holman Bros. Ltd., Camborne, Cornwall.

Heavy Duty Propane Regulator

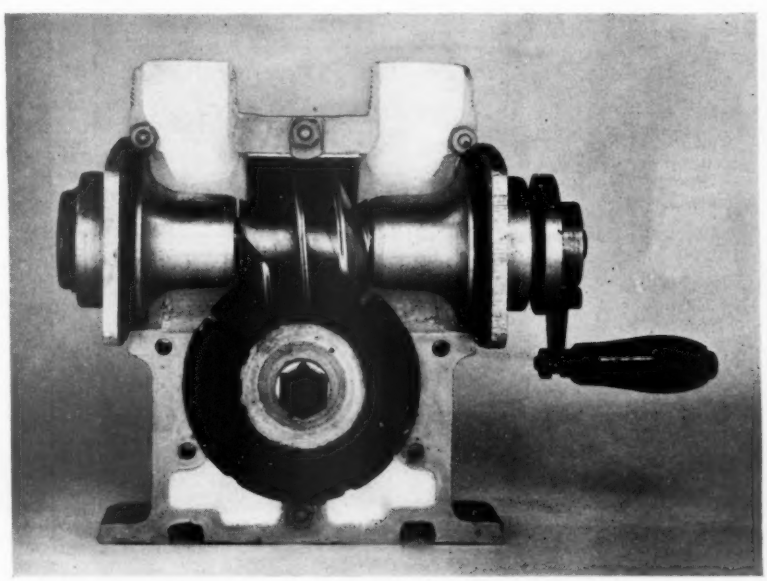
A PROPANE regulator has been developed for use in heavy engineering works, construction yards and so on. Its robust construction is stated to enable it to withstand arduous treatment.



Known as P.R.1, it is a heavy duty, single-stage regulator which is suitable for propane and other liquid petroleum gases, used for heating and cutting applications. The maximum outlet pressure of the regulator is 30 lb. per sq. in., and the maximum flow rate is approximately 300 cu. ft. per hr.

Further details can be obtained from the manufacturer, British Oxygen Gases Limited, Industrial Division, Stephen House, St. James's Place, London, S.W.1.

GIFT TO RUGBY TECHNICAL COLLEGE.—Warwickshire Education Committee has announced the receipt of the first instalment of a gift of £25,000 made by the British Thomson-Houston Co. Ltd. to the Rugby College of Technology & Arts as a part payment of the cost of the halls of residence now being erected in the grounds. The growth in the importance of the college as a centre of technical education is largely the result of the help received from industrial firms, including B.T.H. The establishment of sandwich courses for students in the engineering technologies, for which the halls of residence are being provided, is a feature of the co-operation between college and industry. The halls are believed to be the first buildings of this type to be erected by a technical college.



New Link Between Argentina and Bolivia

Completion of Yacuiba-Santa Cruz Railway

In the presence of Presidents Aramburu of Argentina and Siles Suazo of Bolivia, the Yacuiba (Argentina) to Santa Cruz de la Sierra (Bolivia) railway has been declared open. It provides a long-awaited connection with the rich eastern provinces of Bolivia, which produce among other things, coffee, cocoa, rice, sugar, and wood, and possess great mineral wealth and petroleum deposits.

This railway, built under the auspices of a mixed Argentine-Bolivian committee, and financed mainly by Argentina, was begun in 1944; the first 65 miles as far as Villa Montes were completed five years later. The bridge over the Pilcomayo river, one of the principal features of the line, has only recently been finished.

The second section, 217 miles long, consists of the rest of the line between Villa Montes and Santa Cruz de la Sierra. In this section the line crosses over the rivers Parapeti and Guapay. The total length of the Parapeti bridge is 2,300 ft., which slightly exceeds the total of all the metallic bridges of the Northern Transandine line. The Guapay bridge has not yet been built. It will have four 236-ft. spans, and will be completed, with station buildings and auxiliary works, during the next two years, so allowing of direct traffic over the whole length of the line and eliminating the transhipment at present necessary.

The Boyuibe-Sucre branch is still under construction; the earthworks of the western section having been completed from Sucre to Checollo; and in the eastern section, 25 miles of rails have been laid from Boyuibe to Cuevo. The branch will be 300 miles long, with 50 tunnels.

Difficulties Encountered

The construction of the railway has been undertaken in very difficult conditions. The principal obstacles have been tropical diseases, especially malaria, and the attacks of hostile natives, who in January, 1957, killed four and injured another ten workmen.

The cost of the line is estimated at $U.S.A.35,000,000, of which $25,000,000 has been spent; $6,000,000 will be expended on locomotives and rolling stock.

Western Region Radio Train

For the 1957 summer season, the Western Region equipped the train used on its North Wales Land Cruise with an installation for broadcasting commentaries, recorded music or radio programmes in all coaches. This seven-coach train is now available for party outings, as recorded in our issue of October 25, 1957; and on December 7 the facilities were employed on a football excursion which is the subject of an editorial article on page 124 this week.

The sound equipment for the train was supplied by the General Electric Co. Ltd. A special announcer's compartment next to the guard's compartment in a brake second coach contains a radio receiver, a tape reproducer and a 30-W. amplifier. Tape programmes can be monitored locally in the announcer's compartment.

Restricted Space for Aerial

Medium- or long-wave radio programmes are received on a double-wire aerial supported by stand-off insulators on the roof of the coach. Only 8 in. headroom is available in this position, and the aerial system, comprising two wires running diagonally between opposite corners of the roof, was designed specially to comply with this restriction. The receiver is arranged for switched selection of pre-set stations on both wavebands.

The amplifier, which takes its input either from the announcer's microphone, the tape reproducer, or the radio receiver, feeds 24 loudspeakers mounted on the intermediate partitions in the coaches, above the centre gangways. During the journey, a commentary on the scenery can be interspersed with recorded music or radio programmes. Microphone announcements have automatic priority over any other broadcast, and, if required, the installation in any coach can be easily adjusted so that only announcements are received.

Westinghouse Brake & Signal Co. Ltd.

In his circulated statement to shareholders, Mr. A. R. S. Nutting, Chairman, Westinghouse Brake & Signal Co. Ltd., states that orders received during 1956/57 were greatly in excess of the previous year's record, and dispatches reached an exceptionally large total. The company met with considerable success in competing on the basis of price, delivery dates, and technical excellence for large contracts abroad. A high percentage of the total turnover of brakes and signalling of all kinds has been directly or indirectly exported. The demands of the home market for signalling improved materially; developments in semi-conductors caused increased expenditure and intensification of research and development, and deliveries of brakes for the home and overseas markets attained record figures.

Brake Division

The brake division has, during the year, benefited from the production capacity made available by the use of the Kingswood factory of Douglas (Kingswood) Limited for the manufacture of automotive brakes and pneumatic control equipment. Large orders for equipment for the British and overseas railways have again been received, and substantial deliveries of vacuum brake equipment for British Railways have commenced, and will continue on a long-term basis. Development, particularly with a view to simplification of maintenance procedure, has continued with success.

Signalling

Capital expansion has resulted in appreciably increased production facilities at the Chippenham factory, and in some of the factories of subsidiary companies, with the

Coach showing, through doorway, one of the loudspeakers mounted on the partition

Announcer's compartment in radio train, with sound equipment on right

result that the company is in a position to meet the delivery requirements of existing and anticipated orders. The first orders have been received from British Railways for the Westronic remote control equipment. During the year under review, Westinghouse signalling equipment was exported to 26 countries, and installation contracts are being carried out in various countries of three separate continents, in addition to those contracts being handled by subsidiary companies.

Rectifier Division

Last year the germanium type rectifier was added to the company's range, and a production unit was established for its manufacture at the Chippenham works. This unit is already heavily committed. For some years, research has been directed towards the production of a still more advanced rectifier employing silicon, which opens up the possibility of rectifier applications in many new fields, such as electric traction, electrolytic plants, and many industrial applications beyond the capabilities of copper oxide, selenium, or germanium. The Westinghouse Electric Corporation, United States, has also made notable advances in the rectifier field, and an agreement has been entered into with their International company providing for mutual exchange of technical and other information.

Research and Development

The introduction of 50 cycle traction in this country has necessitated the development of entirely new equipment for track circuits, special instruments for detection and measurement of stray traction current in signal circuits, and a new form of track circuit using a high frequency with transistor equipment.

The company has carried out development on equipment to assist signalling on railways using sleepers where track circuits cannot be used, and on equipment for assisting the automatic operation of hump sorting yards. Research into the best methods of preventing corrosion of signal equipment has been carried out, and further new protective finishes have been developed for all types of rectifiers. Production has commenced of a greatly improved copper oxide rectifier which has been developed, and improved methods of producing selenium rectifiers will be introduced in the current year.

ELECTRICAL DEVELOPMENT ASSOCIATION AT THE ELECTRICAL ENGINEERS' EXHIBITION.—"Light, a tool of production," will be the theme of the Electrical Development Association stand (Stand C4) at the Electrical Engineers' Exhibition at Earls Court, London, S.W.5, on March 25-29. The exhibits on this stand will include the stroboscopic lamp, which enables rapidly moving machines or parts of machines to be examined in motion. It emits a series of flashes, the frequency of which can be varied over a wide range; in use the lamp is directed towards the part to be examined, and the duration of the flash varied until the part can be observed, apparently either moving slowly, at rest, or even working in reverse. Also exhibited will be a device for inspecting surface flatness, a fluorescent crack detector for the examination of highly stressed castings, a device for the inspection of journals or bearings, and a silhouette device for inspecting the accuracy of gear wheels by projecting on to a screen an enlarged outline of the teeth.

Permanent Way Institution Meeting and Conversazione

Mr. R. F. Hanks on the importance of team work and work study

The 74th annual winter meeting of the Permanent Way Institution was held at the Institution of Civil Engineers, London, on January 25. The President, Mr. John Ratter, Technical Adviser to the British Transport Commission, was in the chair. Members attended from all parts of the country. They included Messrs. M. G. R. Smith and Taylor Thompson, Past Presidents, Colonel G. R. S. Wilson, Chief Inspecting Officer of Railways, Ministry of Railways, and Mr. J. L. Cuperus, Past President, Netherlands Railways Way & Works Association.

The Secretary, Mr. H. Janes, and Treasurer, Mr. L. T. Starks, submitted a joint report on the activities of the Institution during the past year, during which 592 new members had joined the Institution, an increase of 39 over the intake of the previous year.

Office Bearers

Mr. Ratter was re-elected President for the current year. The following were elected as Vice-Presidents:

For England: Mr. R. G. Collin; Scotland: Mr. E. J. M. Matheson; Wales: Mr. C. D. Hagley; Ireland: Mr. H. McIntyre; India: Mr. G. Visvanathan; Rhodesia: Mr. J. F. McIntosh; Sudan: Mr. Sayed Ali Bakr Ali Rida; Malaya: Mr. G. M. Wheat.

The present officers were re-elected; in addition Mr. J. A. R. Turner was appointed Assistant Secretary.

Summer Meeting

After members of Council and various committees had been re-elected particulars were given of the 1958 annual meeting and convention to be held at Weston-super-Mare on June 7-12. Visits will include the works of the Gloucester Carriage & Wagon Co. Ltd., those of the Westinghouse Brake and Signal Co. Ltd., at Chippenham, the Permali Limited factory at Gloucester, and Bristol and Avonmouth docks.

A paper on long-welded rails was read by Mr. G. D. S. Alley, Assistant Engineer (Permanent Way) Western Region, British Railways.

Conversazione

The sixth annual conversazione was held the same day at the headquarters of the British Transport Commission. The guest of honour was Mr. R. F. Hanks, Member of the British Transport Commission and Chairman of the Western Area Board. Other guests included:

British Transport Commission and British Railways Central Staff: Messrs. J. W. Watkins, W. P. Allen, Edgar Anstey, R. C. Bond, J. Holden Fraser, A. J. Pearson, S. B. Taylor,

Messrs. K. W. C. Grand, C. P. Hopkins, H. C. Johnson, John Ryan, A. W. Woodbridge, Colonel G. R. S. Wilson, Brigadier C. A. Langley, Messrs. J. L. Cuperus, C. M. Hannoyer, D. Herlihy.

Mr. Ratter, after receiving the guests, addressed the company. He thanked those who had made the arrangements for the evening and worked hard to make it a success. He went on to express the pleasure of members of the Institute at the presence of Mr. Hanks and the other distinguished guests.

The presence of Mr. Hanks, he added, gave the evening a Western Region flavour. They felt this right, as they were this year going to be the guests of that Region at the summer convention at Weston-super-Mare.

Mr. Hanks assured his hearers of a warm welcome in the Western Region at Weston-super-Mare in June.

He wondered if there were anywhere a more lovely stretch of permanent way than the Western Region line, say, from Teignmouth to Dawlish Warren. It was, however, a very troublesome line; he had seen men wrestling with the elements down there up to their waists in water, trying to retain their ballast.

He went on to describe some of the achievements of the first Chief Civil Engineer of the G.W.R., Isambard Brunel. Not all his many varied schemes went aright, but they remembered him today, for example, with great respect every time they passed over the flat-arch bridge at Maidenhead. They intended next year to celebrate the centenary of the Saltash Bridge. Mr. Mark Smith, Chief Civil Engineer of the Western Region, assured him that the bridge was as good today as when built.

Brunel did a great deal, Mr. Hanks added; he was one of the first engineers to see the advantages of standardisation, and it was a fact that many of the members of his timber viaducts could be replaced easily. When permanent way men had been disappointed they should remember the spots in which Brunel used to get himself, and how he extricated himself.

Team Work

Mr. Hanks described how he found great relaxation sometimes in leaving paper work and climbing up on the footplate and going for a run. It did bring one face to face with what railways were about. It was then that he was most deeply impressed by what railway team work really meant—the permanent way, engine and the rolling stock, signals, the complicated scheme of operating, preparation of timetables, payment of wages, and, above all, the great record of safety which was the envy of the whole world. All these things, and more, constituted team work, which he believed to be unparalleled in any other industry.

Last year the Chairman of the British Transport Commission, Sir Brian Robertson, had referred to new mechanical devices which are coming in more and more to the aid of the parmanent way staff. On a recent occasion the Western Region had staged an exhibition of these devices, which were greatly appreciated by the men.

Work Study

As to work study, Mr. Hanks pointed out that this was really only planning of tasks properly and carrying out the tasks. He urged them to give it every support they could. He saw in this more wages, better work, and less effort.

Whenever railwaymen got together they should remind themselves of the facts of life as applying to railways. To say that they were up against it in regard to road and air transport was putting it mildly. He repeated some words which Sir Brian Robertson wrote in his New Year message: "1958 is likely to be a testing year for our country and its economy. It will also be a year of testing for us. There is nothing to worry about if we pull together, but plenty to worry about if we don't."

Mr. H. W. Clarke replied, thanking Mr. Hanks on behalf of the Institution.

The attractions at the conversazione included some British Transport films and an exhibition of posters published during the present century by British Railways and the London Underground.

Questions in Parliament

Radar Not Practicable on Railways

Sir Alfred Bossom (Maidstone—C.) asked the Minister of Transport & Civil Aviation on January 22, "as it is now a scientific possibility, and not unduly expensive," to give a radar or electronic warning of danger of possible collision to an engine driver, and even actually to apply the brakes if necessary, to what extent such a system is being considered at this time to avoid future accidents on the railways of Great Britain.

Mr. Harold Watkinson, in a written reply: The possibility of using radar to prevent railway collisions has been considered by the railway engineers of the B.T.C. from time to time in consultation with scientists who have specialised in radar, and the general conclusion they have reached is that radar, in its present state of development, is not applicable to railway conditions, despite its proved success at sea and in the air. One of the main difficulties, apart from questions of reliability, is that radar works in straight lines; there is, of course, much curvature on the railways, and this would make for confusion between vehicles which were on the same line of rails as the approaching train and those on adjacent lines or sidings. With my full support, the Commission is at present concentrating on the extension of automatic warning control.

A.T.C.

Sir Alfred Bossom (Maidstone—C.) asked on January 22 how many fatal accidents had occurred in the Western Region of British Railways in the last three years; and whether the automatic warning system used in this Region was used on any other lines in Great Britain.

Mr. Harold Watkinson in a written reply: In 1955, 1956, and 1957, there were five fatal train accidents in the Western Region. They comprised a serious derailment at Milton, near Didcot, on November 20, 1955, in which 11 passengers were killed, and four collisions at accommodation crossings in which occupants of road vehicles were killed. In the accident at Didcot the driver failed to respond to a warning by the A.T.C. equipment.

The B.T.C. has not adopted the Western Region type of A.T.C. for the rest of the railways because it is not suitable for electrified lines, and it is not in use in any of the other Regions. On the Tilbury line of the Eastern Region a different system of warning control is in use. The Commission has developed a new British Railways system, which combines the best features of the other two, and this has been installed on the East Coast main line between Kings Cross and Grantham. The new system has proved its reliability, and I approved it at the end of 1956. Active measures are in hand for its extension to all the main routes of British Railways.

B.T.C. Salaries

Mr. David Jones (Hartlepools—Lab.) asked the Minister of Transport & Civil Aviation on January 22 the intentions of the Government with regard to making available to the B.T.C. additional finance to meet the additional salaries recently awarded to both full-time and part-time Members of the Commission.

Mr. Harold Watkinson: No additional finance will be provided by the Government.

Mr. Jones: Does the doubling of the salaries of the part-time Members of the Commission mean that the additional cost is to be met by the Commission, whereas the statement of the ex-Chancellor of the Exchequer on October 29 is to apply to the wages grades on the railways?

Mr. Watkinson: The hon. Member is a little muddled. These gentlemen who give their time in part-time service to the Commission were very much underpaid. They are now being paid more, and that fits in entirely with Government policy which says that when pay increases are made, they must be swallowed within the organisation which gives them.

Effects of Increased Rail Fares

Mr. David Jones (Hartlepools—Lab.) asked the Minister of Labour on January 22 by what percentage it was estimated the cost-of-living index would rise if railway passenger fares were raised by 5 per cent and 10 per cent.

Mr. Robert Carr (Parliamentary Secretary): Increases of 5 per cent and 10 per cent in railway passenger fares, including London Transport railway fares, would cause the idex of retail prices to rise by nearly one-twentieth and nearly one-tenth of one per cent respectively.

Discharge of Sewage on Permanent Way

Mr. Somerville Hastings (Barking—Lab.) asked the Minister of Transport & Civil Aviation on January 22 whether he would give a general direction to the B.T.C. that long-distance passenger coaches should be so constructed that untreated sewage should be no longer discharged on the permanent way.

Mr. G. R. H. Nugent (Parliamentary Secretary): No. This question was recently considered by an expert committee set up by the Commission. It confirmed the view taken by the European and American railway administrations whom they consulted, that there was no practical alternative to the present method of disposal. The committee recommended, however, certain modifications in existing equipment which are being considered.

Staff and Labour Matters

Railway Pay Claims

The claim of the three Railway trade unions, the N.U.R., A.S.L.E.F., and T.S.S.A., for improved rates of pay for railway salaried and conciliation staff employed by British Railways was declined at a meeting of the Railway Staff National Council on January 24. A claim for a shorter working week of 40 hr. for wages staff and a maximum of 38 hr. for salaried staff was also declined.

No amount has been specified in the claim submitted to the B.T.C. by the N.U.R., but the A.S.L.E.F. is seeking a 10 per cent increase in the rates of pay of locomotive grades. The T.S.S.A. desires an increase for its members which will maintain the purchasing power of salaries. The claims of the unions were broadly based on the rise in the cost of living and the disparity of railway rates of pay with those in operation in other nationalised and major industries.

The unions' claims had already been declined at a meeting of the Railway Staff Joint Council and they had been referred by the unions to the next stage of the negotiating machinery, the Railway Staff National Council, on which sit Members of the Commission, General Managers, and members of Area Boards. The Deputy Chairman of the B.T.C., Sir John Benstead, spoke on behalf of the Commission.

The unions were told that British Railways could not afford to pay increased wages; for if a further increase in fares and freight charges took place this would mean a loss of traffic which could not be recovered, especially in cases where the Commission was struggling to keep certain uneconomical services running. A further rise in labour costs would have serious results which might involve a reduction in services. This could react in reductions in railway employment because of a contraction in business.

The representatives of the B.T.C. also emphasised the very short period which had elapsed since the last general settlement was reached in March, 1957, when railway men were granted a 5 per cent improvement in rates of pay. The costs of those increases, it was pointed out, were substantial; and it is understood that further concessions in connection with the present claims would add very considerably to the Commission's payroll. The introduction of a shorter working week on the basis of the claims would involve the Commission in a bigger labour force to meet the fall in output per man which would occur.

All three unions have now decided to refer their claims as to rates of pay to the next stage of the procedure, the Railway Staff National Tribunal. Only the A.S.L.E.F. had decided, as we went to press, to refer the question of the shorter working week to the Tribunal.

London Busmen's Claim

A difficult situation has arisen in connection with the pay claim of the London Transport busmen because the Minister of Labour, Mr. Iain Macleod, declining the request of the Transport & General Workers' Union made with the concurrence of L.T.E. to set up a committee to enquire into the dispute over the wages of London busmen.

The proposal to ask the Minister to appoint a committee of inquiry followed the impasse which had been reached in negotiations between L.T.E. and the T.G.W.U. and the further discussions which had taken place with Sir Wilfred Neden, the Chief Industrial Commissioner on the Union's claim for an all-round wage increase of 25s. a week.

The Minister's decision has been conveyed to the Transport & General Workers' Union in a letter from Sir Wilfred Neden in the following terms:—

"The Minister has carefully considered the request for a committee to inquire into the position arising from the claim of the T.G.W.U. for an increase in wages of all employees covered by the agreement between the L.T.E. and the union, and the confirmation of the Executive that it was not prepared to offer any increase in wages.

"In the circumstances the Minister finds great difficulty in setting up a committee, the purpose of which would be to deal with the wages situation in London in isolation from the rest of the road passenger transport industry. He has, therefore, decided it would be inappropriate to set up a committee for the purpose suggested.

"If all the parties concerned were to request a more general inquiry into the wages situation in the whole of the road passenger industry, the Minister would not wish to rule out such a possibility. It is realised that other interests would be involved in such a wider inquiry.

"If you wish to pursue the immediate and narrower issue, you will appreciate that the normal process of arbitration remains available."

Contracts and Tenders

Main-line diesel-hydraulic locomotives for British Railways

The British Transport Commission has placed an order with British Railways workshops, Swindon, for the construction of 30 2,000-h.p. B-B main-line diesel-hydraulic locomotives. Contracts for the power equipments have been placed by British Railways, Western Region, with Brush Traction Limited, for the supply of Maybach diesel engines, and with J. Stone & Co. (Deptford) Ltd., for Mekydro transmissions. A contract for the supply of the electric control equipment has been placed with British Brown Boveri Limited.

The English Steel Casting Corporation Limited has received an order to the value of £750,000 from Metropolitan-Vickers Electrical Co. Ltd. for 278 four-wheel one-piece cast-steel bogie frames. The order was placed on behalf of South African Railways, and is for the 135 electric locomotives now being built by Metropolitan - Vickers - Beyer Peacock Limited, as recorded in our July 19, 1957, issue. Two bogies will be fitted on each locomotive leaving eight spares.

Metropolitan-Vickers Electrical Co. Ltd. has received an order from the Scottish Division of the National Coal Board for two 14-ton flameproof battery locomotives for use at Rothes colliery.

The British Transport Commission has placed a contract with J. Stone & Co. (Deptford) Ltd., for the supply of 500 Stone-Faiveley pantographs to equip the electric multiple-unit trains and locomotives needed for the following British Railways electrification programmes:—Fenchurch Street to Tilbury and Southend; Liverpool Street to Enfield, Chingford, Hertford East, and Bishops Stortford; Glasgow Suburban; and Crewe-Manchester.

The Atlas Engineering Company, London, S.W.7, has received orders for one Atlas standard wheel truing machine from the Ceylon Government Railways (for the 5 ft. 6 in. section), the Persian (Iranian) State Railways, and the Southern Region of British Railways.

The British Transport Commission have placed the following contracts in connection with the British Railways modernisation programme:—

Automatic Telephone & Electric Co. Ltd., Liverpool: supervisory control equipment for the remote control of switchgear on the Manchester-Crewe electrification

Standard Telephone & Cables Limited, London, N.11: supervisory control equipment for the remote control of switchgear on the Colchester-Clacton electrification

These equipments enable the power supply to be controlled from a central point.

British Railways, North Eastern Region, have placed the following contracts:—

Gulliford & Son, York: erection of the underdrawing to the suspended concrete floors, York Old Station Buildings

Coventry Climax Engines, Limited, Coventry: one diesel fork lift truck, Shildon Wagon Works

Brightside Heating & Engineering Co. Ltd., Sheffield: boiler plant and heating system, Darlington North Road

Ridghouse Limited, Aycliffe, Nr. Darlington: supply and fabrication of steelwork, gantries for Signal Engineer.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Formosa:

31 35-ton all-steel gondola wagons 6,000 type, volumetric capacity 39·47 cu. m., tare weight 16·5 tons.

30 15-ton all-steel gondola wagons 8,000 type, volumetric capacity 19·41 cu. m., tare weight 8·9 tons

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Road, Taipei, Taiwan, Formosa. The tender No. is 84-33-427-9-70272. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The closing date is February 19, 1958. The Board of Trade reference is ESB/1651/58/I.C.A.

From Australia:

24 or alternatively 28 diesel engines, with control equipment, radiators, fans, filters, strainers, starting and cranking motor, converter fluid charging pump, and other equipment required for the safe and efficient operation of the diesel engines

24 or alternatively 28 high degree exhaust silencers with flexible connections

24 or alternatively 28 air cleaners with flexible connections

24 or alternatively 28 hydraulic torque converters with integral automatic lock-up clutches and with reverser mechanism

24 or alternatively 28 air compressors

24 or alternatively 28 generators including matched sets of vee-belts for generator drive, if required

192 or alternatively 224 Aeroquip No. 8 self-sealing couplings

24 or alternatively 28 final drive assemblies, including propeller shafts and universal joints with provision for attaching suitable torque control arm

12 or alternatively 14 driver's controls, suitable for multiple operation of a train, consist up to a total of nine cars

48 or alternatively 56 engine starting panels complete with start and stop buttons and other equipment necessary for the starting, stopping and operation of the engines

40 or alternatively 46 sets of jumper cable equipment, plugs and receptacles for the power cars and non-power cars

Spare parts as may be ordered and selected from the list submitted by the tendered

Certified copies of efficiency and performance tests as carried out by the contractor

Three complete sets of working drawings, wiring and piping diagrams of the equipment, i.e., driving control circuits, safety devices and all electrical wiring of the car for driving control

20 sets of operating instructions, and any other data necessary to efficiently carry out the assembly, installation, operation, maintenance, servicing, and overhaul of same.

The issuing authority is the South Australian Railways. The tender No. is C.M.E. 1/58. Bids should be sent to the Secretary, South Australian Railways Commission, Box 1825, G.P.O., Adelaide. The closing date is March 6, 1958. The Board of Trade reference is ESB/1748/58.

From India:

20 wheel centre, steel for electric motor coach to Ex.BB & C.I. loco. drg. No. CMD-1197

60 wheels and axles, 6 in. by 3 in. journal for C&W N.G. 23 in. dia. on tread to loco. drg. No. CMA-1591

200 wheels, solid rolled or forged, 1 ft. 11 in. dia. on tread but bored 3⅛ in. dia. and not 4⅛ in. as shown on the drg. to I.R.S. drg. No. W-3135, alt. 3

76 wheels and axles, 7 in. by 3¼ in. journal for C&W N.G. 23 in. dia. on tread to loco. drg. No. CMA-1591, alt. 2

50 wheels and axles, 5 in. by 2¼ in. journal for C&W N.G. 23 in. dia. on tread to loco. drg. No. CMA-1591, alt. 2.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is SR2/17518-H/1. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi, India. The closing date is February 14, 1958. The Board of Trade reference is ESB/1664/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

Railways Essential to National Economy

Mr. R. Morton Mitchell, Chief Executive Officer, Road Haulage Association Limited, in a letter published in *The Times* of January 21, stated that capital was continually being sunk in projects that ultimately became obsolete because something better was being devised. It was difficult, he added, to understand why people should think the railways should be immune from the common lot.

Mr. J. H. Brebner, Public Relations Adviser, British Transport Commission, in a reply printed in the January 24 issue, quoted the following paragraph (No. 17) from the Government conclusions on the B.T.C. proposals for the railways (White Paper, Cmd. 9880, October, 1956):—

"The national interest requires that the future of the railways should be assured. As carriers of passengers over long distances and of suburban passengers in large numbers to and from work and as carriers of bulk freight the railways are essential and will continue to be so for as long as can be foreseen."

He pointed out that capital now being invested in the railways was being used strictly for the introduction of modern equipment in fulfilment of this essential rôle, with particular reference to those functions which railways could be made to perform more efficiently than other forms of transport.

Notes and News

Institute of Transport Annual Dinner.—The annual dinner of the Institute of Transport will be held on March 31, at 6.45 for 7.30 p.m. (reception until 7.15 p.m.), at the Dorchester Hotel, Park Lane, London, W.1.

The Transportation Club.—A club dinner will be held at the Transportation Club, 44, Wilton Crescent, S.W.1, on February 18, at 7 for 7.30 p.m. The guest of honour will be Mr. G. R. Pope, Assistant General Manager of *The Times*. The charge will be 30s. per head, to include wines. Dress will be lounge suits.

Retemba Collapsible Containers.—A range of collapsible containers has been introduced by the Warwick Production Co. Ltd. These containers, which were originally developed in Sweden, have panels of laminated waterproofed board. They are stated to have been used favourably by the Swedish State Railways; initially two sizes are in production but other sizes can be produced to individual requirements.

B.R.S. Improved Conditions of Carriage.—British Road Services announce that with effect from February 1 their limit of liability as defined in Condition 9(a) of their Standard Conditions of Carriage will be increased from £400 a ton to £800 a ton without extra charge. The extra cover, which takes account of the general increase in commodity prices since the standard conditions were issued in January, 1951, will apply to all goods despatched on or after February 1, 1958.

Roller Bearing Axleboxes on Fish Vans.—As reported in last week's issue 275 insulated fish vans are being fitted with Timken roller bearing axleboxes; these are being used on the special service known as the "Blue Spot Fish Special," designed to eliminate delays to fish deliveries from North East Scotland to London. The changeover to roller bearing axleboxes involves the fitting of new sets of wheels with 9 in. × 4½ in. journals, manganese liners on the axleguard rubbing faces, and special "horseshoe" adaptors to enable the cylindrical bearing unit to be fitted in place of the existing boxes. The adaptor can be seen in the accompanying illustration, which shows the Timken box as fitted to one of the vans. Conversion is being carried out at the carriage and wagon works of three Regions of British Railways, namely: the Scottish (Cowlairs), North Eastern (York), and Eastern (Doncaster). The numbers of vehicles dealt with are 100, 88, and 87 respectively.

Colour Film on Rust-Inhibiting Paint.—A film, featuring a rust-inhibiting calcium plumbate paint, Rustodian, was shown for the first time in London on Monday. The film, which is in colour, and runs for 22 min., deals with the development and manufacture of the paint and some of its many applications to industry for preserving steelwork against corrosion. The film was produced by the manufacturer of Rustodian, Associated Lead Manufacturers, Limited.

Glasgow Suburban Electrification.—Work is going ahead on the Glasgow suburban electrification scheme of the Scottish Region; and this week a start has been made on the first of the foundations for overhead wiring between Westerton and Singer on the Queen Street Low Level to Helensburgh line. The work has been carried out after the peak morning services and before the evening peak. A works train carrying a concrete mixer, wagons of sand, and other materials was used. The concrete was made on the train and poured into the foundations, which have a central core, into which later on the masts will be placed and grouted in.

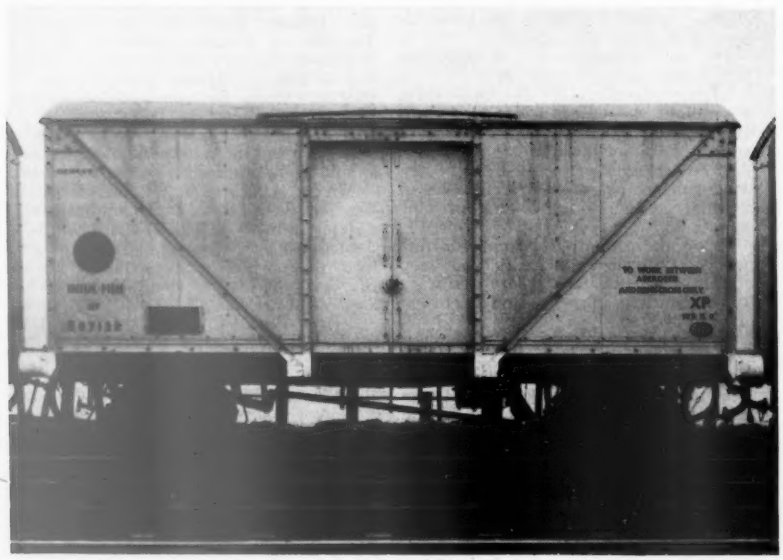
Luncheon to Mr. Maurice Vignon.—Mr. Charles Holt, General Manager of Thos. Cook & Son Ltd., presided at the luncheon given at the Dorchester Hotel, London, W.1, on January 29, to Mr. Maurice Vignon on his retirement as Agent General of the French Government Tourist Office, London, Some 170 persons attended, including Madame Vignon, Mr. C. P. Hopkins, General Manager of British Railways, Southern Region, and many others prominent in the world of transport and travel. The members of the committee were Messrs. J. H. Bamford, H. O. Ernst, F. D. Y. Faulkner, Keith Granville, C. M. Hannoyer, Charles Holt, Shirley James, R.A. Raulin, R. E. Sinfield, Colonel R. A. F. Smith, Messrs. E. F. Spackman, and Geoffrey Sutton. Mr. Vignon is to be presented with a gold watch.

S.G.E. Signalling at Perth.—In referring to the signalling installation at Perth, which is being carried out by the Siemens & General Electric Railway Signal Co. Ltd., on page 115 of last week's issue, it should have been stated that the work of 13 existing signal cabins will be concentrated within one new cabin.

Name for Union-Castle Line Southampton Boat Train.—The Southern Region boat express running between Waterloo and Southampton Docks in connection with the Union-Castle weekly mail steamers to and from South Africa is now called the "Springbok." The name, in cream on a green background, appears on the nameboards of each coach.

Channel Tunnel Project.—The Channel Tunnel Co. Ltd. has announced that three firms of consulting engineers, Sir William Halcrow & Partners, Messrs. Livesey & Henderson, and Messrs. Rendel Palmer & Tritton, have agreed to act as the company's advisers on all engineering aspects of the investigations to be carried out on the projected Channel Tunnel. The Channel Tunnel Company is the principal British constituent of the international study group set up last year to consider the project.

First Diesel Suburban Service for Edinburgh.—British Railways, Scottish Region, will introduce the first of the suburban services worked by diesel train between Corstorphine and Edinburgh Waverley and North Berwick on February 3. The railcars will provide a more frequent service, especially during peak hours; they will cover a total of more than 1,000,000 miles a year, which is double the existing mileage provided by steam trains. There



One of the fish vans fitted with roller bearing axleboxes showing distinctive 15 in. dia. blue spot

One of the Timken axleboxes; note "horseshoe" adaptor

is seating accommodation for 12 first and 106 second class passengers. One of the new trains was on exhibition at Edinburgh Waverley in the afternoon of January 28, to give the public an opportunity to inspect the new type of vehicles being brought into service.

Netherlands Railways Take Delivery of Leyland Buses.—Mr. D. G. Stokes, Director & General Sales Manager of Leyland Motors Limited, handed over the first of a fleet of 300 Leyland underfloor-engine buses with semi-automatic gear-change to the Netherlands Railways on January 17. The ceremony took place in Amsterdam and included a trial run in the vehicle.

Spartan Steel & Alloys Limited.—The manufacture and marketing of its specialised iron and steel products in the United Kingdom has been taken over from Leopold Lazarus Limited as from January 1 by a recently formed company, Spartan Steel & Alloys Limited, of Spartan Works, St. Stephen's Street, Birmingham, 6. In every other respect Leopold Lazarus Limited will continue to trade as previously. The members of the board of Spartan Steel & Alloys Limited are Messrs. M. Lissauer, F. A. Lissauer, E. Josephs, A. A. Lazarus, H. J. Rothschild (all of whom are members of the Board of Leopold Lazarus Limited), Z. Stokowiec and G. Wax.

Oxford University Readership and Research Fellowships in Transport.—Oxford University Congregation last Tuesday accepted the offer by the Institute of Transport permanently to endow a readership and at least two research fellowships to develop the subject of transport, which will be included in the general pattern of research at Oxford into social, political and economic organisation and public administration. Provision is also made for grants to other members of the university to encourage and advance the study of the economics and organisation of transport. The Institute, with the backing of 37 associations and undertakings, will make the endowment in 10 yearly contributions to a total, it is reported, of £150,000. It is hoped that the appointments will be made with effect from October.

Increase in Western German Transport Charges.—Large increases in transport charges have been approved by the Government of the German Federal Republic. On February 1, railway passenger fares will go up 8·7 per cent and freight rates by an average of 14 per cent. This will give the Federal Railway an additional income of £18,000,000 from passenger and £42,000,000 from freight traffic. Workers' tickets will be 50 per cent dearer. Dr. H. C. Seebohm, the Minister of Transport, has stated that the new slogan of the German Federal Railway is to be "modernisation rather than subsidies." Besides railway fares, road transport rates will be increased by an average of 14 per cent to yield an annual £10,000,000. River shipping rates will also be raised on or about February 1.

Chilean State Railways Electrification Contract.—Further details have now been received of the contract placed by the Chilean State Railways with an Italian group, the Gruppo Aziende Italiane, for the supply of rolling stock and materials in connection with the electrification of the line from Santiago to Chillan, recorded in our October 18, 1957, issue. The order includes 34 3,600-h.p. 126-ton electric locomotives, 22 2,400-h.p. 85-ton electric locomotives, five four-car electric trains, three four-car luxury electric trains, 16 sub-stations, one mobile sub-station, and an adequate supply of spare parts. The group has agreed to payment terms on the basis of part on the placing of the order, part on delivery, and the bulk over eight years in six-monthly instalments at an interest rate of 7 per cent per year inclusive of credit insurance costs. The International Bank has agreed to finance the contract.

Balfour, Beatty & Co. Ltd. Subsidiary Formed.—Balfour Beatty & Co. Ltd. has formed a wholly owned subsidiary Balfour Beatty (Overseas) Limited, which qualifies as an overseas trade corporation for the purposes of the Finance Act, 1957. The business of civil, mechanical, and electrical engineering contractors carried on by Balfour, Beatty & Co. Ltd., in East Africa, Iraq, and Malaya, will be undertaken by the new company, which will be under the same management and direction as the parent company.

Rail-mounted Inspection Unit at Runcorn Viaducts.—The rail-mounted viaduct inspection unit described in our issue of November 15, 1957, has been loaned by the North Eastern Region of British Railways for inspection of the Runcorn Viaducts, London Midland Region, before the erection of electrification equipment on the Weaver Junction to Liverpool line. The viaducts approaching the Runcorn Bridge are too narrow to take line-side masts of the conventional type. The unit will be employed on January 26, and February 2, to investigate the best positions for special structures which are being designed to pass over the sides of the viaduct.

Additional Sidings for New Power Station at I.C.I. Thornton Works.—Additional sidings are being constructed to serve a power station being built by Imperial Chemical Industries Limited at their works at Thornton near Fleetwood; the work is being carried out partly by British Railways, London Midland Region, and partly by I.C.I. The first stage was completed by railway engineers last Sunday, and the main part of the work is expected to start within the next two months. On railway land it includes a shunting neck with accommodation for a locomotive and 30 wagons, associated earthworks, and the extension of a footbridge. The new sidings inside the works being provided by I.C.I. consist of a reception road and a run-round road, also full and empty wagon sidings, and sidings leading to the wagon tipping equipment. The power station, which will supply electricity to the group of I.C.I. Works in the Fleetwood area, will require some 200,000 tons of coal annually in the early stages, rising to an eventual consumption of more than 400,000 tons.

Door-to-Door Transport to Germany by B.R.S. Trailer.—A British Road Services trailer carrying an electronic computer valued at over £40,000 left Boreham Wood, Herts., on January 25, on a 500-mile door-to-door journey to Wetzlar, in Western Germany. The computer travelled on the trailer throughout the journey, without transhipment or protective packing; it crossed the North Sea from Tilbury to Antwerp in the "drive-on, drive-off" Transport Ferry vessel *Empire Baltic*. The computer weighs about 3 tons, is 17 ft. long, 7 ft. high, and 3 ft. wide; it was loaded on a B.R.S. 10-ton semi-trailer. From Antwerp a Belgian tractor hauled the trailer via Aachen to Wetzlar. The transport arrangements were made for the shipping agents, Weigel Leygonie & Co. Ltd., by B.R.S. in conjunction with their associated shipping line, the Transport Ferry Service. The customs agents were Thos. Cook & Son Ltd. The computer was constructed by Elliott Bros. (London) Ltd., and has been exported to a German camera manufacturing firm.

U.S.A. Railways Reduce Capital Expenditure.—Railway companies in the U.S.A. are reported to be making drastic cuts in their capital spending programmes in an effort to reduce losses resulting from declines in passenger and freight revenues. The New York Central, for example, which in 1957 had a capital budget of $250 million, is cancelling all improvement expenditure in 1958, according to Mr. Alfred E. Perlman, President of the system. The railway, he has stated, is not making a working surplus, despite economies. The Illinois Central is discontinuing its car-building programme in 1958. The U.S.A. railways last week decided to reduce the proposed charge for loading and unloading import and export freight from 10 cents to 6 cents per 100 lb. The decision was taken at a special meeting of the carriers. The revised rate and announcement of intention to put various new tariffs into effect have been submitted to the Interstate Commerce Commission.

Forthcoming Meetings

February 3 (*Mon.*).—The Historical Model Railway Society, at the Railway Tavern, Liverpool Street, London, E.C.2, at 7 p.m. Talk on "Materials and techniques for the modeller," by Mr. R. S. Garlick.

February 4 (*Tue.*).—Institute of Transport, Irish Section, at the C.I.E. Club, Dublin, at 6.15 p.m. Paper on "Training for transport management," by Mr. D. Stewart.

February 4 (*Tue.*).—Institute of Transport, North Western Section, at the Town Hall Annexe, Manchester, at 6.15 p.m. Paper on "Railway management," by Mr. E. W. Arkle.

February 4 (*Tue.*).—The Institution of Civil Engineers, at Great George Street, Westminster, S.W.1, at 5.30 p.m. Paper on "The use of aerial photography by railways," by Messrs. N. E. V. Viner-Brady and H. M. Pearson.

February 4 (*Tue.*).—Institute of Transport, at the Connaught Rooms, Great Queen Street, W.C.2, at 12.30 for 1 p.m. Informal luncheon. Principal guest Sir Edward Boyle, M.P., Parliamentary Secretary, Ministry of Education.

February 4 (*Tue.*).—The Railway Correspondence & Travel Society, Sheffield Branch, at the Livesey Clegg House, 44, Union Street, Sheffield, at 7.30 p.m. Paper on "A museum for transport," by Mr. J. H. Scholes, Curator of Historical Relics, B.T.C.

February 5 (*Wed.*).—Electric Railway Society, at the Fred Tallant Hall, 153, Drummond Street, London, N.W.1, at 7.15 p.m. Paper on "Electric railways in Moscow and Leningrad," by Mr. J. H. Price.

February 5 (*Wed.*).—British Railways (Southern Region) Lecture & Debat-

ing Society, at the Chapter House, St. Thomas' Street, S.E.1, at 6 p.m. Continental film night.

February 5 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Loft Green, York, at 5.30 p.m. Paper on "Developments in signalling equipment in relation to the 25 kV. electrification project," by Mr. W. M. Sweetenham.

February 6 (*Thu.*).—British Railways (Western Region) London Lecture & Debating Society, at Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper illustrated by lantern slides, on "Travel on foreign railways," by Mr. C. Holt, General Manager, Thomas Cook & Son Ltd.

February 7 (*Fri.*).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Annual general meeting (members only) followed, if time permits, by a photographic display by Mr. R. C. Riley.

February 7 (*Fri.*).—Institute of Transport, Western Section, at the Docks Office, Queen Square, Bristol, at 1.15 p.m. Paper on "The conveyance of livestock and perishable traffic by passenger train," by Mr. M. P. Glenister (student).

February 7 (*Fri.*).—Stephenson Locomotive Society, Scottish Area, at 25, Charlotte Street, Edinburgh. Members' ten-minute papers.

February 8 (*Sat.*).—Stephenson Locomotive Society, Scottish Area, at 302, Buchanan Street, Glasgow, at 2.30 p.m. Paper on "Engines that might have been," by Mr. A. M. Riley.

February 10 (*Mon.*).—Institute of Transport, London Section, at the Jarvis Hall (R.I.B.A.), 66, Portland Place, London, W.1, at 5.45 p.m. Brancker Memorial Lecture. "Problems and economics of air traffic," by Air Commodore W. E. G. Mann, Director-General of Navigational Services, Ministry of Transport & Civil Aviation.

February 11 (*Tue.*).—Railway Correspondence & Travel Society, East Midlands Branch, at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Display of slides from the collection of the late Dr. Budden.

February 12 (*Wed.*).—Institution of Railway Signal Engineers, London Section, at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 6 p.m. Paper on "B.T.C. automatic train control system," by Mr. J. H. Currey.

February 12 (*Wed.*).—Institution of Electrical Engineers. Faraday Lecture on "The electrification of the British Railway." Prepared by the late Mr. G. H. Fletcher, delivered by Mr. R. Ledger, at Central Hall, Westminster, S.W.1, at 6 p.m.

February 12 (*Wed.*).—Stephenson Locomotive Society, London & Southern Area, at Caxton Hall, Westminster, London, S.W.1, at 6.45 p.m. Paper on "Canadian National locomotives in the 1920s," by Mr. D. W. Allen.

February 13 (*Thu.*).—Stephenson Locomotive Society, Midland Area, at the Grand Hotel, Broad Street, Bristol, at 7.30 p.m. "Some reminiscences of a railway and civil engineer," by Mr. W. A. Willox.

February 14 (*Fri.*).—Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, Eversholt Street, London, N.W.1, at 7.15 p.m. Paper on "Early Bagnall locomotives," illustrated by lantern slides, by Mr. W. A. Smyth, Managing Director, W. G. Bagnall Limited.

February 15 (*Sat.*).—Stephenson Locomotive Society, North Western Area, at the Conference Room, Central Station, Liverpool, at 7.15 p.m. Paper on "Wirral rail and canal facilities," by Mr. A. Perry.

Railway Stock Market

Sentiment in stock markets has been affected by fears that higher wage demands may result in labour troubles after the latest developments in connection with the claims of London Transport busmen. Apart from the continued strength of British Funds, which again reflected the belief that a lower bank rate is inevitable sooner or later, stock markets have been uncertain again; in the circumstances foreign railway stocks attracted little attention and were inclined to ease.

Canadian Pacifics were active, partly because of the moderate rally on Wall Street. Sentiment in the City is governed very much by continued doubts whether there will be an early recovery of business activity in the U.S.A. The cheaper money policy being followed by the authorities there should provide a stimulus, but the talking point is whether an even bigger boost of some kind may prove necessary. Despite cheaper money in the U.S.A. and the cut in the Western German bank rate to only 3½ per cent., the City is still assuming that our bank rate may not be reduced until the April Budget.

Canadian Pacifics have not held best levels, but at $48½ maintained most of last week's rally. The company's entry into the oil business by the formation of a special subsidiary opens up important possibilities for the future, bearing in mind the large area of land in which it is interested. White Pass shares at $14 compared with $14¼ a week ago.

On the other hand there has been further selling of Antofagasta ordinary stock, which declined afresh from 17¼ to 16, while the preference stock was fractionally lower on balance at 33½, sentiment having been affected by the fall in the price of tin and copper and the fear of lower traffics. Nevertheless it would seem that the decline in these stocks has been carried too far, though this does not mean they will not go lower if markets remain uncertain. Present levels it appears could provide a favourable buying opportunity for the investor willing if necessary to hold for a year or more despite fluctuations.

San Paulo Railway 3s. units were again quoted at 2s. 1½d. while United of Havana second income stock receded to 6¾ though the consolidated stock was again quoted at 2.

Chilean Northern 5 per cent debentures have rallied to 35½, but Quayaquil & Quito assented bonds eased from 75½ to 72½. In other directions, International of Central America common shares improved $16½ to $19½ and the preferred stock from $122 to $125.

Among shares of locomotive builders and engineers, G. D. Peters remained firmly held and quoted at 28s. 1½d., while at Glasgow, Hurst Nelson at 25s. 9d. were within 3d. of the level a week ago, and in other directions, North British Locomotive remained at 12s. Beyer Peacock 5s. shares at 8s. 1½d. have strengthened. Charles Roberts 5s. shares were also 8s. 1½d.

Westinghouse Brake shares, which responded further to the annual statement, were 34s. 1½d., compared with 32s. 9d. a week ago. Gloucester Wagon 10s. shares kept at 13s. 9d. and Wagon Repairs 5s. shares at 13s. 6d.

Buyers were again about for T. W. Ward, which moved slightly higher at 73s.; but the 5s. shares of Pressed Steel eased from 13s. to 12s. 9d., though elsewhere, Ransomes & Marles have firmed up to 10s. and Associated Electrical were better at 48s. 3d., compared with 47s. 9d. a week ago. General Electric improved from 37s. 6d. to 38s. 3d. and English Electric from 46s. 7½d. to 47s. Birmingham Wagon shares moved up from 16s. 9d. a week ago to 17s. 3d.

OFFICIAL NOTICES

DRAUGHTSMEN, also a Technical Assistant, required for West End office. Railway or automotive experience preferred. Pension Scheme also luncheon vouchers provided.—Apply in writing, stating age, experience and salary required, to: General Manager, British United Traction Ltd., 96 Piccadilly London, W.1.

REQUIRED for the Southern Railway of Peru Ltd., LOCOMOTIVE CARRIAGE AND WAGON DRAUGHTSMAN. Must have served a full general apprenticeship in an engineering workshop (preferably railway) and have had at least five years' consequent drawing office experience. Age: 30/35 years. Salary: £1200/1400 per annum plus approximately 20 per cent. cost of living allowance. Apply in writing: The Peruvian Transport Purchasing Co. Ltd., Rex House, 38 King William Street, London, E.C.4.

COMPETENT TECHNICAL REPRESENTATIVE required by old established company engaged in the design and manufacture of railway signalling equipment. Situated in the South of England. Applicants must have good technical knowledge and experience and be familiar with railway requirements and must be capable of maintaining good customer relationship already existing. Good commencing salary with opportunities for promotion.—Write in confidence to Managing Director, Box 516, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

DRAUGHTSMEN, SENIORS and DETAILERS. The expansion of our development work on disc brakes for railway rolling stock has created additional posts for design and detailing staff on this project. The senior posts carry considerable responsibility requiring much original thinking, and sound previous experience of railway work is essential. Junior detail draughtsmen need have no previous railway experience but have the opportunity to acquire it. Salaries range from £513 per year for detailers at 21, to £900 per year for first class design staff.—Applications should give full details of age, academic qualifications, training, and experience, and should be addressed to the Personnel Manager, Girling Limited, Kings Road, Tysley, Birmingham, 11.

POWER RECTIFIERS

A LARGE manufacturing firm in the Midlands requires an ENGINEER to assist in development and design of high power rectifier equipments. The Department handles rectifiers of all modern types and for all kinds of applications, offering scope for exceptionally wide experience and interest, with good salary and prospects. Previous rectifier experience not necessary, but an electrical or mechanical degree or approximate equivalent, and some practical experience, are desirable. Very good residential district, with excellent educational facilities of all kinds. —Apply with full details to Box 506, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

SIGNAL ASSISTANT. East African Railways and Harbours Administration. To be responsible to the Signal and Telegraph Engineer for the installation and maintenance of all signalling apparatus. Pensionable appointment in the salary range £1170 to £1755 p.a. gross. Free passages for the officer, his wife and family; free furnished quarters if available. Free medical, but not dental attention. Generous leave. Candidates, between 30 and 40 years of age, must be A.M.I.R.S.E. and have thorough experience of mechanical signalling and interlocking, with reasonable knowledge of power signalling and electrical interlocking. Capable of designing, estimating and controlling new works for both mechanical and electrical signalling and controlling the maintenance organisation associated with such installations.—Write, Director of Recruitment, Colonial Office, S.W.1, stating age, qualifications and experience. Quote BCD 173/052.